

Scale Insects in Orange Juice

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December 2014

Introduction

A. Overview

This document will discuss the concern that there may be forbidden insects in retail containers of orange juice. [See the footnotes for acknowledgements¹ and the bibliography of research papers used in researching this topic.]² The first half of the document will describe the concern, including information on the insect and its presence in juice, and the second half will discuss the halachic issues this raises.

B. Sizes

This document will discuss items which are quite small, which raises two issues. Firstly, the smallest common unit of length in the American method of measurement is an inch. If we were to use that unit of measure, we would be faced with the unwieldy and confusing possibility of using numbers such as 0.0024 or 0.0098 inches. The most accurate for such tiny items is the “micron” (μm), which is equivalent to one thousandths of a millimeter or 0.00003937 inches, but that term is too unfamiliar to most readers. This document will compromise between these possibilities and use the millimeter (mm) as its unit of measure.

A second issue is that the items discussed in this document are so small that they are truly difficult to visualize. The following sizes of common items are given so as provide a frame of reference:³

¹ Acknowledgements: Rabbi Yoel Feingold, of Lakewood, has taken the lead in researching the practical and halachic issues related to the subject of this paper, and this document would never have taken on its current form without his significant sharing of this knowledge and experience. In addition, the cRC had the foresight to invest the time, resources, and finances so that the author could research and present the findings contained in this document for the benefit of the broader public.

In addition, the document is based on meaningful discussions and consultations between the author and (alphabetically) Rabbi Shlomo Dickman (Lakewood), Rabbi Sholom B. Dubov (Florida-K Kosher), Rabbi Asher Anshel Eckstein (Belz Kashrus), Rabbi Shmuel Felder (Lakewood), Mr. Michael Mas (JBT), Rabbi Dovid Steigman (OK Kosher), Rabbi Meir Sternberg (Lakewood), and Rabbi Sholom Tendler (Star-K). Lastly, the author has read a number of scholarly research papers on the topic, and personally visited a large juice processor to investigate the issue. The author thanks these contributors, while taking full responsibility for the content of this paper.

² The following is an alphabetical list of articles used. For each article there are 5 pieces of information, separated by a semicolon as follows: Publisher; Document ID; Title; Link; How document is referred to in this paper.

- New Zealand Entomologist; 1995, Volume 18; Size and fecundity of soft wax scale (*Ceroplastes destructor*) and Chinese wax scale (*C. simt*) (*Hemiptera: Coccidae*) on citrus; <http://bit.ly/lyZQrm>; NZE 1995:18.
- University of California, Agriculture and Natural Resources; n/a; Degree-Days; <http://kshr.us/1qORM8>; UC DD.
- University of California, Agriculture and Natural Resources; n/a; Degree-days: Reference Tables (California Red Scale; <http://kshr.us/1AOgTAh>; UC DD RT CRS.
- University of California, Agriculture and Natural Resources; Publication 7408; Scales; <http://ucanr.edu/sites/sjcoeh/files/77098.pdf>; UC ANR 7408.
- University of California, Agriculture and Natural Resources; Publication 21529; Life Stages of California Red Scale and its Parasitoids; <http://kshr.us/1AOf2LU>; UC ANR 21529.
- University of Florida, UF/IFAS Extension, Entomology and Nematology Department; ENY 814; Scale Pests of Florida Citrus; <http://edis.ifas.ufl.edu/ch059>; UF ENY 814.
- University of Florida, UF/IFAS Extension, Horticultural Sciences Department; HS 817; A Guide to Scale Insect Identification; <http://edis.ifas.ufl.edu/ch195>; UF HS 817.
- University of Florida, UF/IFAS Extension, Horticultural Sciences Department; CIR 1241; Florida Crop/Pest Management Profiles: Citrus (Oranges/Grapefruit); <http://edis.ifas.ufl.edu/pi036>; UF CIR 1241.

³ Measurements of the items listed in the chart are from the following sources:

- Personal measurements by the author using a digital caliper (alternate measurements with a USB microscope appeared to be inaccurate) – poppy seeds, sesame seeds, grain of salt, grain of sugar.
- *Particulate Matter*, EPA, available at <http://kshr.us/1EJ25XS> f – human hair.
- *Mesh vs. Micron Comparison Chart*, Netafim USA, available at <http://kshr.us/1xkjk9R> – visible to human eye.
- *VWR*, available at <http://kshr.us/1CQB6F6> – Reynolds aluminum foils.
- *Thickness of a Piece of Paper*, available at <http://kshr.us/1CQuvus> – sheet of paper.



Item	Length	Width
Sesame seed	3.20	1.80
Poppy seed	1.20	0.78
Grain of sugar	0.66	0.44
Grain of salt-most brands Individual grain sizes vary considerably	0.62	0.57
Grain of salt-Diamond Crystal Individual grain sizes vary somewhat	0.31	0.31

Item	Length	Width
Visible to unaided human eye (minimum)	0.04	0.04
Sheet of paper (thickness)	n/a	0.10
Human hair (width)	n/a	0.07
Reynold's Aluminum Foil Heavy duty thickness	n/a	0.024
Reynold's Aluminum Foil Standard thickness	n/a	0.016

Part 1 – The Concern

C. Lifecycle

The unusual lifecycle of the scale insect plays a critical role in many aspects of the halachic sh'ailah, and we therefore begin with a description of the relevant details⁴

Citrus fruit commonly harbor scale insects on the outside of their peels. Scale insects are born at less than 0.25 mm (smaller than a grain of Diamond Crystal salt, but much darker) crawl away from their mother, and find another fruit (or tree part) which they will inhabit.⁵ The hours between when the insect is born and it finds its way to a new location, is the only time during its lifetime that it will walk, and therefore during that period it is referred to as being in the “crawler” stage.⁶ Upon arriving at its destination, the crawler takes a number of steps (not necessarily in this order) to permanatize its new home:

- It sticks a straw-like rostrum into the fruit, through which it will extract/suck nutrition from the fruit.
- It rotates its body while excreting a waxy substance, so as to create a relatively thick protective cover over its entire body.

This scale-like feature of the insect is the reason why this class of insects is referred to as “scale insects”. The scale-cover is typically round or oval, and have a diameter of 1-3 mm (between the size of a poppy seed and a sesame seed).

⁴ The details of the scale insect's lifecycle are based on the current scientific understanding, but it is noteworthy that the existence of many of the stages and forms which the insect passes through (as will be noted in the coming text) have been personally witnessed recently by Rabbis by inspecting oranges in which insects were trapped underneath the wax-like coating applied to the fruit before they are sold to the public. In this manner they have seen mature females covering tiny eggs, crawlers emerging from the eggs, crawlers with legs, and other stages of growth up to and including mature adult insects. [At some of these stages, identification was only possible via magnification; the significance of that will be discussed in the second half of the article.]

⁵ An insect which was born on the ground or on a tree, is forbidden even if it was never שורץ (walked), and if it was born on something which is not attached to the ground then it remains permitted until it is שורץ (see *Shulchan Aruch* 84:4). The *Gemara, Chullin* 67b has a *machlokes* as to whether an insect which was born on a fruit which is attached to the ground is forbidden without being שורץ, and *Shulchan Aruch* 84:6 rules leniently on this question. *Rema* (ad loc.) describes a case which seems quite similar to citrus scale – an insect found in a “tight spot” (within a bean) where there is clearly no room for it to have been שורץ – and based on the assumption that the insect was never שורץ he rules (as per *Toras Chattas* 46:2, cited in *Taz* 84:10 and *Shach* 84:19-20, but see *Darhei Moshe* 84:5 and *Gr"a* 84:20) that *l'chatchilah* one should be *machmir*, but if the food is already cooked (or juiced) one can be lenient. At first glance, scale insects appear to match this description – an insect found in a spot which is so “tight” that they cannot possibly be שורץ there – in which case there would be basis for permitting the insects while on the fruit. However, (a) in light of the understanding that the insect, in fact, passes through a crawler stage when it is שורץ, and (b) the assumption that most people encounter the insect after it has already left the fruit where we will apply the halacha (*Shulchan Aruch* 84:4, but see *Shach* 84:12 citing *Toras Chattas* 46:5) that *מפריש* is *assur*, this point is moot.

⁶ It will be noted below that the mature male regrows legs and wings. The male leaves the fruit shortly afterwards, and therefore from the perspective of scale insects found on the fruit (or in the juice), it is appropriate to say that they only have legs in the crawler stage.

- It sheds its legs, since it has no future use for them.

The legs, and skin which molt from the scale later in life, become incorporated into the scale-cover. The scale-cover has an inherent clear or white color, and it is the legs and skin added to it which create the common dark/black color generally associated with scale covers.

Female scale insects permanently remain in the location which they have chosen (as described above). In that spot they absorb nutrition from the fruit, give birth to young, molt their skin (twice), and grow to as large as 0.5-1.0 mm, before dying. As the insect grows and molts its skin, it passes through growth stages known as “1st instar”, “2nd instar” and “3rd instar”. During the earliest stages of development, the insect and scale-cover are separate from one another, but [in many varieties] in the later stages the insect becomes more thoroughly attached to the scale-cover.

In contrast, male scale insects go through 2 instar stages and then grow new legs and wings, after which time they leave the fruit, mate, and die.⁷ Since the male insect only remains on the fruit for approximately half as long as the female (and because the female dies on the fruit),⁸ it is much more common to find female scale insects (and their shell-covers) on the outside of fruit, rather than males. [For an interesting diagram of the information presented above, see page two of UC ANR 21529.]

For simplicity sake, henceforth, the following terms will be used: “**insect**” will refer to the scale insect without its cover; “**cover**” is the scale-cover with no insect attached to it; and “**scale**” will be reserved for the combination of both insect and cover.

D. Presence in Orange Juice

Farmers can control the presence of scale on fruit either with pesticides or by introducing natural predators (e.g. wasps). These methods are used aggressively for fruit which will be sold on the retail market, because the presence of scale makes the fruit appear less desirable. However, the outer appearance of the fruit is insignificant at a commercial juice processors, and therefore much less attention is paid to preventing scale on fruit grown for that purpose. It is therefore not surprising that the oranges used at those processors, have a fair number of scale on most fruit.

Juicing an orange involves steps which might transfer the scale into the juice (more on that below). Juice processors do not want a significant presence of scale in their juice as that would be unappealing to consumers and even a lesser number of scale would force them to label the product as being of a lower grade (or even unsuitable for retail sale). At the same time, the processing of the juice includes the following steps which would reduce the presence of scale in the finished juice: the oranges are washed and scrubbed (usually on two separate occasions) before juicing, all juice passes through a 0.50 mm “finisher” which filters out the pulp and a

⁷ For an interesting video about citrus scale insects, and particularly about the mature male (towards the end), see <http://kshr.us/13YU0gD>.

⁸ UC ANR 21529 provides many details about the California Red Scale. It notes that a female of that species will remain on the fruit for approximately twice as long as the male will. [In addition, the female eventually dies on the fruit while the male leaves beforehand.]

The exact length of the insect’s stay is measured in “degree days”, where days with warmer weather count for more since they help the insect develop quicker. As noted in the chart in UC DD RT CRS, days where the temperature remains below 50° provide zero degree days, days when it is well over 90° F provide as much as 51 degree days, and the more typical days provide some amount in between (60-70° F is 12 degree days, 70-80° F is 22, 80-90° F is 32, and 90-100° F is 42). In this context, UC ANR 21529 notes that females remain on the fruit for upwards of 650 degree days, while males are only there for 380 degree days. Therefore, if, for example, the temperature was between 80-90° F for an extended period of time, the female would remain on the fruit for more than 20 days while the male would leave after less than 12.



significant amount of the scale,⁹ and the processing itself – which includes pressing, pumping, heating, and other steps – presumably causes many of the scale to disintegrate or break apart. Of the aforementioned steps, the washing and scrubbing definitely reduce the number of scale, but they also leave a considerable number on the fruit.

As a result of the above, most consumers never see scale in their juice, and the processors are convinced that this is because there are (essentially) no scale to be found. However, in recent months, some concerned *frum* Jews have been filtering and inspecting juice and were surprised to find a steady number of tiny insects and a lesser number of covers, in the juice. The issue was first raised as relates to Tropicana orange juice, but further investigation showed that there was also some presence of insects and covers – albeit less frequently than in Tropicana juice – in other brands of juice which were tested. [More on this below.]

Those who made this discovery responsibly brought it to the attention of their local *Rabbonim* and the certifying agencies. The *Rabbonim* involved considered this to be a serious issue, and cautiously advised the people involved to continue their research while simultaneously probing the halachic issues and searching for suppliers who could provide juice which is free of these concerns. This continued for a number of months as the topic continued to be researched from different angles. At this point, the issue has come to the attention of the public¹⁰ and a wider group of *Rabbonim*.

E. Discovery in Orange Juice

The standard method of filtering liquids or fine powders (e.g. flour) to check for infestation is to pass them through a filter which is 50-70 “mesh”, which means that the space between the holes of the filter are 0.30-0.21 mm.¹¹ [In measuring filters, a higher “mesh” means that the space between the holes is smaller and the filter is therefore more fine.] This size is used in many industrial/lab settings and is also used by consumers in *Eretz Yisroel* who sift their flour (to remove insects) before using it. When individuals and company-labs filtered orange juice with this type of filter, they were (essentially) unable to find insects or covers, since all of them seemed to pass right through the filter.¹²

In order to actually find insects and covers in orange juice, the following method is used. First the juice is filtered with a 50-70 mesh cloth to remove the largest particles from the juice (some skip this step), and the liquid which passed through that filter passes through a second filter which is 230 mesh. A 230 mesh filter has holes which are only 0.063 mm across (about the thickness of a piece of hair) and it takes a considerable amount of “coaxing” to get relatively thick orange juice through it. However, after 30-60 second of shaking the filter (and sometimes even spraying it with a powerful stream of water), 6-8 ounces of juice will pass through the 230 mesh filter, leaving behind a syrup-like mixture of pulp, juice and other matter.

⁹ The finishers used in industrial plants typically have holes which are 0.020 inches (0.508 mm), and in some plants the holes are 0.015 inches (0.381 mm). These finishers are designed to trap pulp and certain other particulate, and this prevents most scale (particularly the larger ones) from remaining in the juice.

¹⁰ One of the main catalysts for the issue coming to the attention of the broader public was an article by Rabbi Yair Hoffman, which can be found at <http://kshr.us/RYHTropicana>.

¹¹ A.k.a. 30-21 microns. Information on mesh sizes is taken from <http://kshr.us/1xkIcJan> and <http://kshr.us/1xkIk9R>. The text uses the standard nomenclature for filtering materials, but it is worth noting that some companies refer to filters by the micron-size of the holes, and would therefore refer to the “50 mesh” filter noted in the text as a “30 mesh” since the holes in the filter are 30 microns.

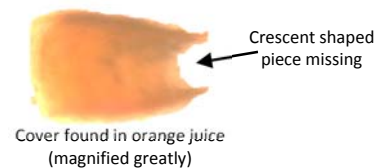
¹² As a result of this, when Tropicana was asked to check specific samples of their juice, they were unable to ever find scale, and another lab which checked a sample found no evidence of insects. Individuals who followed the procedure outlined in the coming text, were able to identify scale.



The insects and covers have no legs, whiskers, eyes or other features which would identify them as living beings (or covers) to people who have not been trained to identify them. [See picture of insect at right and of cover, below.]¹³ However, those who are experienced and trained, can find insects and covers in the material trapped by the 230 mesh filter. The insects and covers tend to be somewhat round and oval respectively, and have an overall symmetrical shape.



In general, when viewed without magnification, the insects appear to be whole, while the covers found in orange juice tend to be missing (a) a crescent-shaped piece from one end (as shown in the picture at right), and (b) the legs and molted skin that become attached to the waxy portion of the cover (leaving just the white or off-white portion). These points, and their significance, will be discussed in more detail below.



Some of the Rabbis investigating this issue are under the impression that the insects they are finding belong to a specific class of scale insects which have an elongated shape to them (*Unapsis Citri*, Citrus Snow Scale), and they were supported in this by a reputable lab's report. However, the oranges arriving at juice plants appear to be equally infested with the standard, round, scale insects (*Chrysomphalus Aonidium*, Florida Red Scale).

F. Tropicana vs. Other Brands

Over the past few months that people have been checking orange juice for scale, they have consistently found more insects and covers in Tropicana brand orange juice than in off-brand/private-label not-from-concentrate juices (e.g. brands specifically marketed to kosher consumers). By no means was this a scientific study – accurate records were not maintained and minimal tests were done on each brand – but the overall impression has been that Tropicana juice is more significantly affected by this issue than other brands. The estimated “statistics” are that Tropicana averages one insect per 6 ounce sample (equivalent to about 10 insects per 64 ounce bottle) and one cover in each bottle, Trop50 (a Tropicana product)¹⁴ had a similar amount of insects but more covers, while other brands have 2-6 insects per bottle and they almost never find a cover.

Different explanations have been suggested as to the difference between brands: some believe that it has to do with the thickness of Tropicana juice (which may indicate a less-rigorous filtering/finishing),¹⁵ the method of juice extraction,¹⁶ or the presence of more orange oil (found

¹³ Pictures of insect and cover are courtesy of Rabbi Eckstein and Rabbi Feingold respectively.

¹⁴ Trop50 is a Tropicana beverage made with 42% (not from concentrate) juice, water, vitamins, stevia, flavor, and other ingredients.

¹⁵ All testing was performed on juice which is sold as “pulp-free”, but some brands contain more particulate and/or are overall more viscous than others, leading to the possibility that there are different standards of “pulp-free”.

¹⁶ The way in which homemade orange juice is made is by slicing the orange in half, and then squeezing each half over a juice reamer. This process puts a considerable amount of pressure on the outside of the orange peel, and – all who have ever done this can testify that it – releases a meaningful amount of orange oil and citrus scale. Industrially, there are two major methods of extracting juice, known as “Brown” and “JBT”, the names of the companies that sell these systems. This author has not yet been granted permission to see the Brown process in an actual juice plant, but based on reading company literature (see for example, <http://kshr.us/1H0AIWV> and <http://kshr.us/1H0B3cf>) discussions with industry personnel and people who have been in “Brown” plants, it appears that the Brown reaming system has a similar affect as a home-reamer; as the juice is extracted, a meaningful amount of orange oil and scale get mixed into the juice.

In contrast, the JBT method is quite different. The author has seen and studied that system in a plant setting, in a manually-operated industrial machine used for testing, and through other methods of research, and the exact details of exactly how that system operates are beyond the scope of this document, but what is significant is that it almost completely eliminates contact between the juice and the peel (and orange oil and scale). As the juice is essentially pushed/sucked out of the center of the orange through a large

in the peel or rind).¹⁷ At this point, those suggestions are all in the realm of conjecture, and there is no clear explanation for the difference in findings.

Part 2 – Halachic Issues

The halachic question as to whether orange juice is permitted in spite of the presence of scale can be organized into the following points:

- Are the insects forbidden? Might their size or other factors be a basis for suggesting that they are actually insects which the Torah permits?
- Are the covers forbidden?
- Are the scale batel to the juice since they are so well mixed into the juice? Is bitul possibly inappropriate because the insect is a beryah or because it is possible to remove the insect from the juice?

These issues will be discussed in this section of the document.

G. Insect Size

The insects found in orange juice are approximately 0.18-0.35 mm¹⁸ and generally have no appendages or other features (nor are they mobile) through which one can identify them as living beings. They are about the size of Diamond Crystal salt and without magnification they look exactly like tiny pieces of salt, such that the average person can see the insect with the naked eye (once it is separated from the juice) but cannot possibly identify it as an insect. Does the *Torah* forbid insects which are so small?

It is generally accepted that microscopic organisms are not forbidden as “bugs”, and, of course, insects which are large enough to be identified as such are surely forbidden. There is, however, significant debate as to the status of insects which are between those two extremes: insects which are large enough to be visible to the naked eye but not large enough to be identified as insects without magnification. The following are some of the positions taken by *Poskim*:

- **Currently Identifiable**
Insects are only forbidden if they are currently in a form where they are identifiable with the naked eye. In other words, if the insect is moving or is large enough that one can

straw-like pipe, all oil (and scale) released in the process spray onto the “outside” of that equipment where they physically cannot get mixed into the juice. [Although the outside of the peel is severely cut during the process, the cuts only penetrate the flavedo (orange outer layer of the peel) and not the albedo (white inner layer just under the flavedo), thereby preventing contact between the scale (which are on top of the flavedo) and the juice (which is in cells that are under the albedo).] Based on this consideration alone, it would be understandable that juice produced using the JBT method would be less likely to have scale in it.

Industry personnel believe that Tropicana is one of the only major companies which continues to juice orange using the Brown system, and that all other major processors – and possibly as many as 80-90% of the juicers worldwide – use the rival system sold by a company called JBT. If correct, that might be a plausible explanation as to why other brands of (not from concentrate) orange juice have been found to have fewer insects and covers that the Tropicana juice extracted via the Brown method.

However, the reasons to discount this line of reasoning are that (a) part of a standard Brown process is to scrape off outer layers of the orange before juicing, so as to recover orange oil (see, for example, <http://kshr.us/1DsRWwR> and <http://kshr.us/1DsRGy5>), which should remove more of the scale before juicing, (b) although Tropicana Pure Premium only contains juice from Florida (see <http://kshr.us/1BUcGLW>), the Trop50 product often contains juice from Brazil where the JBT method is used almost exclusively, and (c) industry personnel report that companies commonly sell juice to one another to fill certain needs, such that Tropicana products may potentially contain juice produced via the JBT method and vice versa.

¹⁷ Although one might expect orange oil extracted from the peel to frequently contain scale, in fact, the oil is filtered and centrifuged before use such that there rarely is any scale in it. See the previous footnote regarding the method in which oil is extracted from oranges in the “Brown” method. The suggestion that Tropicana actually adds rind into the juice so as to create a unique taste, seems to be baseless and counterintuitive.

¹⁸ At times, adult insects have been discovered in the juice which were as large as 0.55 mm (the size of a larger grain of salt).



identify appendages such that they can tell that this is a bug, then it is forbidden, but otherwise it is permitted even if there were times in the past when it could have been identified.

This position is founded on the assumption that אין הקב"ה בא בטרוניא עם בריותיו¹⁹ and would not forbid people from eating items which they cannot possibly avoid. [In fact, this was the same logic used in the original halachic determination that microscopic insects are not forbidden.] The difficulty with this position is that it leads to a situation where an insect which was moving or had appendages on Monday is forbidden at that time, but if it then is dead, immobile, and/or lost its identifying appendages on Tuesday it will suddenly be permitted. Can an insect possibly be forbidden on Monday and permitted on Tuesday? This leads directly to the second position.

- **Once Was Identifiable**

An insect which was ever in a form where it was identifiable with the naked eye is forbidden, even if it subsequently impossible to be recognized.

This position (and the coming one) will seemingly be forced to say that – in light of the fact that some forbidden insects cannot be identified by people who might eat them – individuals must devise radical or creative means to avoid eating those insects which were ever identifiable, and where that is impossible then they are deemed an אונס for violating the prohibition. Thus, for example, a person might remove any speck of foreign matter from their lettuce since they have no way of distinguishing between a permitted piece of leaf and a forbidden insect which is no longer identifiable.²⁰ Alternatively, they might use magnification to teach themselves to differentiate between different specks.

- **Visible**

Any insect which is large enough that each²¹ individual insect can be seen without magnification, is forbidden even if there was never a point when it was identifiable.

It is not clear that there are any insects which never move once they are large enough to be visible, such that this position would forbid them but the previous one (Once Was Identifiable) would not. [Whether scale insects may be an example of this will be discussed below.] Nonetheless, conceptually, this position considers any visible insect as forbidden and does not consider identifiability as having any significance, while the previous position agrees somewhat to the first position (Currently Identifiable) that, in fact, this is the significant criteria.

Although many *Poskim* have expressed views on this matter, the nuanced differences between the first and second positions, and the second and third positions, makes it difficult to specify which *Poskim* take exactly which position (see the coming footnotes for details). That said, many contemporary *Poskim* – including *Chazon Ish*, Rav Shlomo Zalman Auerbach, Rav Elyashiv and Rav Dovid Feinstein²² – have accepted a stricter approach, although as noted, it is not always clear if

¹⁹ See *Gemara, Avodah Zara 3a*.

²⁰ One could argue that most specks are not insects and therefore one is not halachically required to remove every speck, and can instead assume that the specks on their food are not insects. Thus, the wording of the text merely suggests what might be required for one to avoid any insects, based on this standard.

²¹ If it were to be that any living being where a collection of them can be seen with the naked eye (even though one individual being cannot be seen), then yeast and certain other foods would be forbidden as they are a “living being” which can be seen with the naked eye. Accordingly, the assumption is made that even the strictest standard is of the opinion that each individual being must be visible without magnification.

²² *Shmiras Shabbos K'hilchaso* (Chapter 3 footnote 105) reports that Rav Shlomo Zalman Auerbach originally followed a more lenient standard (seemingly, the Currently Identifiable standard), and later changed his mind because (a) he was told that *Chazon Ish* was *machmir*, and (b) “he” (it is not clear if this refers to *Chazon Ish* or Rav Auerbach) learned that there is a time when scale insects can be seen to move (more on this below). Was *Chazon Ish* only *machmir* because of this second reason (i.e. the Once Was Identifiable standard) or was he *machmir* regardless of that (i.e. the Visible standard)?



they followed the middle (Once Was Identifiable) or most-strict (Visible) standard. In contrast, others – including Rav Chaim Ozer Grodzinski and Rav Vosner²³ – follow a more lenient approach, and again as noted, it is not clear if they accept the most lenient (Currently Identifiable) or the middle (Once Was Identifiable) position.

As relates to this issue, Rav Gedalia Dov Schwartz²⁴ has directed the cRc to adopt the most lenient approach, and this is also the position of certain other national American *hashgachos*, while certain “*Heimische*” *hashgochos* and the *Mehadrin* Israeli *hashgochos* accept one of the stricter approaches.²⁵ [Local Va’adim in the United States take different approaches to this matter, based on the rulings of their *Rabbonim Hamachshirim* or the training of their Administrators.]²⁶

The application discussed in this document (citrus scale) is one where the potential violation is a *d’oraisah* of eating an insect which is clearly there. In contrast, most other applications of this issue, such as whether one must wash strawberries with soap so as to remove the thrips larvae which are only forbidden according to the two stricter standards, only relate to a Rabbinic requirement to check/clean foods which are infested to the level of *miut hamatzui*. Thus, those who are *machmir* as relates to the *d’oraisah* application might be lenient in the less-serious situations where it is no more than a *d’rabannan*.

An important detail of this discussion relates specifically to the insects found in orange juice. There is no question that the most lenient standard noted above will rule that the insects are permitted because they are not identifiable as insects in their current state. Similarly, the strictest standard will rule that the insects are forbidden since they are visible. What about according to the middle standard (Once Was Identifiable)? Were the scale insects ever identifiable as (living) insects? Rav Auerbach, noted above, appears to accept that they were identifiable when he states that:

גם נודע לו כי לפני שהכנימות מתכסות בקליפת המגן, גם בעין רגילה יכולים להרגיש קצת ברחישתן

*He was also made aware that before the insects are covered with scale,
one can somewhat notice their movement even with the naked eye*

He appears to be saying that when the insects are in the crawler stage they are large enough to be seen as they leave the protection of their mother and move to the location where they will spend the rest of their lives. If so, they were once identifiable as insects, and according to the middle standard that suffices to render them as forbidden forever. This is understood to mean that although the crawlers are amazingly tiny (less than 0.25 mm), a person can “somewhat

Similarly, a *talmid* of Rav Elyashiv told this author that Rav Elyashiv was *machmir* on this question (and that ruling is also printed in his name in *Bedikas Hamazon K’halacha* B:2:4), but it is not clear if that is because he followed the most-strict interpretation (Visible) or a variation of the middle standard. The ruling of Rav Dovid Feinstein was publicized in his *teshuvah* on the copepods in New York City water, where he appears to follow the middle standard.

²³ A *talmid* of Rav Tuvia Goldstein told this author that his Rebbi repeated from Rav Yisroel Gustman that Rav Chaim Ozer Grodzinski was of the opinion that one could be lenient on the above issue. Another *talmid* of a *talmid* of Rav Gustman corroborated this, and a similar ruling can be found in *Shevet HaLevi* 7:122. Does that mean that they held like the most lenient (Currently Identifiable) standard or like the middle standard (Once Was Identifiable)? Those who repeat these rulings believe that they follow the most-lenient standard, but this is clearly subject to interpretation.

²⁴ Rav Gedalia Dov Schwartz is *Rosh Beis Din* at the Chicago Rabbinical Council.

²⁵ The *Rabbonim HaMachshirim* for many of the national American *hechsherim* have told this author that they agree with the most lenient approach, and this view is also espoused by Rav Shlomo Gissinger, a recognized expert in *hilchos tola'im* who is the ultimate source of much of the American policies on these matters. In contrast, Rav Vaye, the recognized expert from *Eretz Yisroel*, teaches that one should follow a stricter approach (as cited above from his *Sefer Bedikas Hamazon K’halacha*) and many have adopted that approach.

²⁶ For more on this topic, including a discussion of the possible proofs and counterarguments, listen to the *shiurim* by this author at <http://kshr.us/54YUJ8JK>, <http://kshr.us/4fJK34KV>, and <http://kshr.us/55UHJ78>.



notice” them as they move across the surface of the fruit, and that is enough to forbid the insects in all future stages.²⁷

Conclusion

There are different standards used to determine which insects are too small to be forbidden, and the status of the citrus scale insects depend on these opinions.

The cRc and certain other national hashgochos follow the more lenient approach, and accordingly are of the opinion that these insects – and, of course, the covers of these insects and the orange juice which contains them – are permitted. The rest of this document will discuss whether there is basis for permitting orange juice according to those who accept the stricter approach on this issue.

H. Status of the Covers

As has been noted earlier, the covers which are visible on the outside of oranges are comprised of a off-white waxy substance secreted by the insect, mixed with the dark legs and skin which have separated from the insect. However, in the orange juice, the only parts found are the wax portion of the cover, without any of the legs or skin.

Legs and skin which separate from an insect are as forbidden as the insect itself, and therefore if they were detectable in the orange juice they would essentially pose as much of a concern as the insects. The same is not true of the covers, for the following reason. When the *Torah* forbade the consumption of certain creatures, that prohibition includes the flesh of the animal/insect, any flavor from the animal which is absorbed into another food (טעם כעיקר), and also the edible excretions of the animal. This prohibition, known as the יוצא of the animal, is the reason why milk from a non-kosher animal is forbidden. However, the only secretions which are forbidden are those which leave the animal’s body in an edible form, but those which leave in an inedible form are classified as פירשא (excrement) and are permitted.

The aforementioned principles of יוצא and פירשא are agreed to by most *Poskim*, but there is a debate as to the application of those principle to the secretions of insects. *Iggeros Moshe*²⁸ rules that these same principles apply to insect secretions, and therefore shellac, an inedible wax secreted by lac insects, is kosher and can be used in the production of candies and chocolates. The wax leaves the insect’s body in an inedible form, and it is therefore classified as permitted פירשא even though it is subsequently converted into a food ingredient. In contrast, Rav Elyashiv²⁹ argues that the permissibility of inedible secretions is limited to secretions from an animal which is inherently edible, such that the inedibility of the secretion indicates that it does not share its “parent’s” status. However, insects themselves are forbidden in spite of their being inedible, and this teaches that inedibility is not a factor for insects, such that the inedible secretions of an inedible insect – such as shellac – are forbidden as a יוצא.

²⁷ It was reported that Rav Shlomo Miller said (somewhat differently) that even if no one has ever watched the fruit from the point that the crawler came onto the fruit until the visible scale grew and formed, we cannot ignore the scientific knowledge of the current era that the scale on oranges are not dirt but rather covers an insect which once crawled in a visible manner. [In fact, one can watch videos online (see, for example, <http://kshr.us/13YU1q>) which are essentially time-lapse photos taken over many hours, where the insect is seen to crawl onto the fruit and create the cover.]

²⁸ *Iggeros Moshe* YD 2:24. See also *Darhei Teshuvah* 84:187.

²⁹ *Koveitz Teshuvos* 1:73:f.



That difference of opinion relates to the covers of scale insects as well. *Iggeros Moshe* will be of the opinion that the inedible wax cover of a scale insect is permitted in much the same way as shellac, while Rav Elyashiv will argue that it is forbidden.³⁰

The common practice as relates to this question follows much the same pattern as the previous one (size of insects). The national American *hashgochos* follow the lenient approach of *Iggeros Moshe* and certify shellac and products which contain it, and most local Va'adim accept this approach as well. Therefore, these groups would not be concerned about the consumption of scale covers. At the same time many "*Heimishe*" *hashgochos* in the United States, and most of the *Mehadrin* Israeli *hashgochos* follow the stricter position of Rav Elyashiv (or some variation of it), and will not accept products with shellac as kosher. Accordingly, they would also be potentially concerned with the presence of scale covers in orange juice.

Conclusion

There are two different opinions as to whether shellac is kosher, and those who are machmir on that question would have a similar opinion about scale covers.

The cRc and certain other national hashgochos follow the more lenient approach, and accordingly are of the opinion that the scale covers – and, of course, orange juice which contains them – are permitted.

I. Bitul

The general rule is that when a non-kosher food is mixed into kosher food, the mixture is permitted if there is little-enough *issur* to be *batel* (diluted) in the kosher part of the mixture. The basic rules of *bitul* are that (a) there must always be more *heter* than *issur* (*bitul b'rov*), and (b) if the non-kosher provides a positive taste into the kosher, then there must be 60 times as much *heter* as *issur* (*bitul b'shishim*). In our case, where there are just a few insects and covers per bottle of juice, there is surely enough orange juice to be *mevatel* the *issur* with *shishim*,³¹ and therefore at first glance it seems obvious that the juice is permitted. The insects and covers may be forbidden, but they are *batel b'shishim* in the juice and therefore the juice is permitted.³²

However, we will see in the coming sections that there are two possible reasons why *bitul* may be inappropriate in this situation: the insect might be a *beryah*, and the mixture may not qualify as a true *ta'aruvos*.

J. Beryah

There is a well-known rule that if a forbidden item is a *beryah* – complete item which is inherently forbidden – then it can never be *batel*.³³ A *beryah* is so prominent that *Chazal* decided that the concept of nullification is antithetical to it, and cannot be effective. The covers are not a living

³⁰ The example discussed in this document, scale covers, is somewhat different than that of shellac, for shellac is an inedible item which is later used as a food item and therefore in its finished/current state it is edible, while scale covers remain inedible. Nonetheless, it appears that this would not be sufficient reason for Rav Elyashiv to permit covers.

³¹ In truth, the insects qualify as *nosein ta'am lifgam* where *bitul b'rov* suffices (*Shulchan Aruch* 104:3), but the term *bitul b'shishim* was used for simplicity's sake.

³² Although, as a rule, *hashgochos* will not certify a food in which one purposely mixed in any *issur* even if that *issur* is *batel b'shishim*, but in cases such as this where the *issur* is "inherent" to the product such that it surely qualifies as *אין כוונתו לבטל* (see *Nodah B'yehudah* YD 1:26 (הגה"ה) & 2:56-57, cited in *Pischei Teshuvah* 84:10, and in *Nachlas Tzvi* ad loc.) and there is always well over 60 times as much *heter* as *issur*, they would typically be willing to certify the product.

³³ *Shulchan Aruch* 100:1.

being, and therefore surely do not qualify as *beriyos*,³⁴ but what about the insects? However, what about the insect? The insect appears to be complete, so should we say that it is a *beriyah* and cannot be *batel* even if there are thousands of times more juice than insects?

It appears that there are a few reasons why this is incorrect. The most basic reason is because, during most stages of the insect's life it has a rostrum through which it sucks nutrition from the host fruit, and this rostrum is almost never connected to the insects found in the juice.³⁵ [Presumably, it breaks off when the insect is separated from the fruit.] Thus, although the insect looks complete, a better understanding of its anatomy indicates that it is missing a significant limb.³⁶

Other reasons to consider that the insect can be *batel* in spite of its apparent status as a *beriyah* are:³⁷

- The processing, filtering, and pasteurization of the juice raise a reasonable doubt as to whether the insect is complete, and *safek beriyah can* be *batel*.

Although it is true that *safek beriyah* is permitted³⁸ one could question the applicability of that principle to our situation. Firstly, although there are ample opportunities for the insect to be dismembered, many of the insects found in orange juice appear to be complete. Secondly, *Shulchan Aruch*³⁹ discusses a parallel halacha, of someone who cooked food without checking for infestation, and rules that *b'dieved* the food is permitted. However, *Shach*⁴⁰ notes that the food is only permitted in cases where the food typically has a *miut hamatzui* of insects, such that the responsibility to check the food before eating from it is merely *d'rabannan*. But if the food is *muchzak* to be infested and it was cooked without being checked, the food is forbidden. Seemingly, if Tropicana orange juice has more than one insect per cup then that qualifies as *muchzak* to be infested, and the food should be forbidden in spite of the possibility that the processing removed the status

³⁴ In other words, the *chumrah* of *beriyah* is limited to items which are or were once alive (*Shulchan Aruch* 100:1), and therefore the covers are not *beriyos*. In addition, the covers do not meet the criteria of שאם יחלק אין שמו עליו, and as we have seen above, the covers are commonly missing a crescent-shaped piece of themselves such that they are not complete.

³⁵ Personal observation of those checking orange juice, and confirmed by Rabbi Tendler via email with Dr. Beth Grafton-Cardwell IPM Specialist and Research Entomologist and Director of Lindcove Research and Extension Center, and one of the authors of UC ANR 21529. It is possible that even when the rostrum is attached to the insect, it is only visible via magnification, such that its absence may not be considered significant. On the other hand, much of the information presented in the document including the identification of the insect can only be verified through magnification, and it seems incongruous to forbid an insect based on magnification, but not be willing to permit it for the same reason.

³⁶ *Gemara, Nazir* questions how much of an insect must be missing before it is no longer considered a *beriyah* as relates to receiving *malkos* for eating it. Does the term "*beriyah*" refer to an insect which is complete or one which is viable? If it means "complete" then even if the insect missing a leg or some other non-critical body part (אבר שאין הנשמה תלויה בו) it is no longer a *beriyah*, but if the term refers to something which is viable then it only loses that status if it is missing a part of the body that it cannot live without. The *Gemara* does not resolve this question. The *Rishonim* understand that this same question can also be raised regarding the status of *beriyah* as relates to the halacha that a *beriyah* cannot be *batel* (see *Beis Yosef* towards the end of YD 101). Accordingly, *Shach* 100:6 rules that since the aforementioned question is unresolved and it is a mere Rabbinic principle that a *beriyah* cannot be *batel*, one may be lenient and assume that if as soon as an insect is missing any part of its body – even a non-critical part – it is no longer a *beriyah* and can be *batel b'shishim*.

Thus, even if the rostrum were to be a non-critical organ of this insect, an insect without a rostrum is not a *beriyah*. In fact, since all of the insect's nutrition is absorbed through the rostrum, it would appear that the rostrum is an אבר שהנשמה תלויה בו and there is no question that if it is missing then the insect is not a *beriyah*. [See also the end of the next footnote.]

³⁷ Is the insect not a *beriyah* because it loses its legs as it attaches itself to the fruit? It would appear that since the insect's legs are only intended to be used for the first few hours after birth, they are considered a "temporary" or "disposable" part of the insect and their absence does not indicate that the insect is incomplete. In a sense, this insect's legs are akin to hair cut off an animal's head, the umbilical cord severed from a newborn calf, or the egg-tooth which falls off a bird a few days after birth.

The same cannot be said of the rostrum. Although there are stages during the insect's life when it does not have a rostrum, the rostrum plays such a critical role for so much of the insect's life that it seems clear that if the rostrum is missing then the insect is not a *beriyah*. [See also the previous footnote.]

³⁸ *Taz* YD 100:1; the reason for this is that it is only a *d'rabannan* that a *beriyah* cannot be *batel*, and therefore is there is a *safek beriyah* it qualifies as ספק דרבנן להקיל.

³⁹ *Shulchan Aruch* 84:9.

⁴⁰ *Shach* 84:29.



of *berayah*. [Some have argued that the presence of 2-6 insects per bottle in other brands, also qualifies them as *muchzak* to be infested.]

On the other hand, there is basis for saying that the strict position of *Shach* is limited to situations where the person was expected to have checked the food before cooking, and since he chose to ignore that responsibility, he may not eat the food in spite of being merely a *safek berayah*.⁴¹ In the case of orange juice, that would mean that someone who squeezes their own orange juice at home would be expected to remove the scale beforehand, and if he didn't then the juice could be forbidden even *b'dieved*. But, if the person purchased commercially produced orange juice where there is no possibility for the Jewish consumer to remove the scale before juicing, he may rely on the strict letter of the law that *safek berayah* is permitted.⁴²

- One of the criteria for *berayah* is that it is referred to differently before and after it is whole (ואם יחלק אין שמו עליו). The fact that all refer to this as a “scale insect” in spite of the uncertainty as to whether it is or is not whole (as above), indicates that there is no difference in title for the whole insect, such that it is not a *berayah*.⁴³
- The reason a *berayah* is not *batel* is due to its prominence (as noted), and that rule is therefore inherently inapplicable to insects which are infinitesimally small and clearly have no “prominence”.

This line of reasoning is noted in *Mishkenos Yaakov*,⁴⁴ and is most well-known due to its being recorded in *Aruch HaShulchan*⁴⁵ as one of three elements of his *limud zechus* for those who are not as careful as needed in checking vegetables. Similarly, he suggests that insects are revolting to people (as per *Shulchan Aruch* 104:3) and therefore *Chazal* would have never given it the prominent status of a *berayah* as relates to its not being *batel*.⁴⁶ Both of these assume that a *berayah* is generally not *batel* due to the inherent prominence of a complete item, but *Aruch HaShulchan* himself notes earlier⁴⁷ that the *Rishonim* say that *berayah's* prominence is based on the fact that one received *malkos* for eating a *berayah* even if it is smaller than a *kezayis*. This feature indicates a *Torah*-based prominence to a *berayah*, and *Chazal* extended that to the halacha that a *berayah* cannot be *batel*. Accordingly, *Aruch HaShulchan* himself notes, since one receives *malkos* for eating a *berayah* even if it is tiny and disgusting, it logically should also have the Rabbinic status of *berayah* such that it cannot be *batel*.

⁴¹ See *Shulchan Aruch* and *Rema* YD 39:2 (as per *Shach* 39:8) that *Rema* is of the opinion that *Chazal* were *machmir* (except in cases of הפסד מרובה) in the case of נעבדה הראיה as a means of enforcing the original requirement to check for common *teraifos*. *Pri Megadim* SD 84:29 implies that the *chumrah* of *Shach* 84:29 regarding עבר ובישלו when the food is מוחזק בתולעים is related to the aforementioned *chumrah* of נעבדה הראיה.

⁴² Whether a *hashgachah* certifying the juicing of orange should have the stricter status of someone required to remove the insects before juicing, is a question that is beyond the scope of this document.

⁴³ Rav Yona Reiss, *Av Beis Din*, Chicago Rabbinical Council.

⁴⁴ *Mishkenos Yaakov* YD 36. A somewhat related point is made by *Iggeros Moshe* YD 4:2 who considers that one might be lenient, as follows:

שמעתי איזה אנשים אמרו בשמי איזו סברה בעניין התולעים הקטנים שנודע שנמצאים בהרבה ממיני הירקות. והנה ידוע שלא אמרתי בזה שום הכרעה. ולהיפך דעתי נוטה יותר להקל, וכמו שהזכרת בשאלה, שאתה ובני הרה"ג מוה"ר שלו ראובן שליט"א כתבתם לי, שאפשר שדבר שלא נראה למעשה לעינים אינו אסור, ולכל הפחות אינו בחשיבות בריה, וזה נוסף ללימוד הזכות שמוזכר בערך השולחן סימן ק' סעיפים י"ג - י"ח.

⁴⁵ *Aruch HaShulchan* 100:13-18.

It is noteworthy that *Aruch HaShulchan* states (100:13 & 15) that infestation was so common that were people to follow the letter of the law, they would face an indescribable *sha'as hadchak* (שעת הדחק שאי אפשר לצייר) of being essentially unable to eat bread and beans (אם לא שלא נאכל לחם וגורופין) such that he finds it appropriate to rely on minority opinions. Clearly, the inability to drink Tropicana orange juice would not begin to approach that level of *sha'as hadchak*. On the other hand, see *Kovetz Teshuvos* 1:74 (end) where Rav Elyashiv suggests that if a given food cannot easily be checked for bugs and will therefore become forbidden for an entire year/season, that qualifies as a *hefsed gadol* (ולאסור כל המין אין לך הפסד גדול מזה).

⁴⁶ [See, however, *Shulchan Aruch* 100:1 who cites נמלה (an ant) as an example of a *berayah* which cannot be *batel*.] One could question the applicability of this line of reasoning to our situation, for although people find ants, flies and other larger insects to be disgusting, it is not clear that the same can be said of scale insects (or even of aphids, thrips and many of the other small insects commonly found in vegetables) which even the most conscientious companies and consumers do not make any attempt to remove from their food. On the other hand, one can argue that when *Mashgichim* point out these insects to people, most people are, in fact, revolted by their presence such that people's acceptance of these infestations may be more a matter of ignorance than tolerance.

⁴⁷ 100:2 & 16-17.



- There is a minority opinion in the *Poskim* that a *beriyah* can be *bateil* if there is more than 960 times as much *heter* as *issur*.⁴⁸ Although the general halacha does not accept this opinion,⁴⁹ this may be an added *tziruf* to be lenient.

Conclusion

Although the insects found in orange juice appear to be whole, they can be bateil and are not considered beryos. This is primarily because they are missing their rostrums. Other reasons to consider bitul appropriate are that there is a safek if parts of the insect were broken off during processing, very small insects may never qualify as beryos, and some are of the opinion that when diluted in more than 960 times even a beryah can be bateil.

K. Removable

Under the assumption that the halacha of *beriyah* does not prevent the insect from being *bateil*, we now move to the second possible reason why *bitul* may be inappropriate.

A prerequisite for *bitul* is that the *issur* and *heter* are not distinguishable from one another. A corollary of that rule is that *bitul* is not effective if it is possible to separate the *issur* from the *heter*. Although all agree to this latter principle, there are two distinct opinions within the *Poskim* as to the reason for it. Many⁵⁰ are of the opinion that it is a basic (*d'oraisah*) element of *bitul* that if the *issur* can be removed then there is effectively no *ta'aruvos* (mixture). Others⁵¹ disagree and suggest that although the items are considered to be mixed together – as evidenced by the fact that in their current state one cannot distinguish the *issur* from the *heter* – since it is possible to remove the *issur* there is a Rabbinic requirement to do so. Just like *Chazal* say that a *davar sheyesh lo matirim* cannot be *bateil* because a person should use the food in the completely permitted way instead of relying on *bitul*, so too if the *issur* can be removed then one should do so and avoid consuming the *issur* via *bitul*.⁵²

⁴⁸ See *K'raisi U'plaisi* (*Plaisi* 100:2) who cites and defends those who accept this position. [This possibility is one of the three *limud zechus* points raised by *Aruch HaShulchan* noted above.] Since there is obviously more than 960 times as much juice as insects, the insects would be *bateil* according to this opinion.

⁴⁹ See, for example, *Shulchan Aruch* 100:1 as per *Gr"a* 100:5.

⁵⁰ The following is a list of *Poskim* who share the strict opinion, prepared by Rabbi Dickman: *Tevuos Shor* (end of *sefer*), *Pri Toar* 84:15, *Chochmas Adam* 51:1, *Chasam Sofer* YD 277, *Beis Shlomo* 2:157 s.v. *vegam*, *Maharshag* YD 1:45 s.v. *u'mah she'hikshah*, *Yad Yehudah* 69:61 s.v. *od ra'isi*, *Yeshuos Yaakov* 84:5, *Avnei Nezer* YD 81, *Eretz Tzvi* 88, and *Chazon Ish* 14:6 & 24:8.

⁵¹ See, for example, *Tzemach Tzedek* YD 70:5.

It may be that one can bring a proof to this question from the following halacha. *Rashba* (*Toras HaBayis* 4:4 page 38b) states that if a non-kosher dish was mixed into kosher dishes, the dishes may all be used if the non-kosher dish is *bateil b'rov*, and although it is a *davar sheyesh lo matirim* since one could *kasher* all of the dishes (and remove the forbidden absorbed flavor), one is not required to go to such lengths to avoid a *davar sheyesh lo matirim*. *Ra'ah* (ad loc. page 38a) argues that the reason to *kasher* is not because of *yesh lo matirim* but rather because anytime the *issur* is noticeable (i.e. removable) there is no *ta'aruvos* and there is no limit to how much one must do to remove the *issur*. *Rashba* (*Mishmeres HaBayis* on page 38a) replies that, in fact, that is not true, and just because it is possible to remove an *issur* does not automatically disqualify the mixture from being considered a *ta'aruvos* where *issur* can be *bateil*. Thus, it seems that *Rashba* and *Ra'ah* are disagreeing on exactly the point noted in the text: is the requirement to remove the *issur* from a mixture based on *davar sheyesh lo matirim* (which has limitations) or because such mixtures are not a *ta'aruvos*. If this is correct, then the fact that *Shulchan Aruch* 102:3 & 122:8 accepts the lenient opinion of *Rashba* would indicate that he follows the more lenient approach. [Although some *Poskim* disagree as to whether *kashering* is considered an unreasonable amount of *tirchah*, they seem to agree in principle to *Shulchan Aruch's* ruling.] This requires further consideration.

⁵² A seemingly related issue discussed in the *Acharonim* is whether a mixture in which one can see the *issur* but not remove it, is considered a *ta'aruvos* that is able to take advantage of *bitul*. *Chazon Ish* 30:3 (see also *Chazon Ish* 14:6) says that this question is actually a *machlokes* with *Shach* 104:3 following the lead of *Rema* 104:1 to be lenient, and *Taz* 104:1 accepting the decision of *Shulchan Aruch* 104:1 to be strict. [See *Taz* and *Beis Yosef* (to 115:3) that the question may be dependent on a *machlokes Rishonim* regarding the status of ענין; see *Rambam*, *Hil. Ma'achalos Assuros* 3:15 and *Toras HaBayis* 3:6 page 90b.] On this question, *Pri Chadash* 104:3 is *machmir* as is *Chazon Ish*, *Chavos Da'as* (*Biurim* 104:1) follows *Rema* and *Shach*, and *Minchas Yaakov* 85:17 says that *l'chatchilah* one should be *machmir* but in cases of *hefsed merubah* one can be lenient (and *Chochmas Adam* 51:3 appears to accept this approach).



According to the latter of these opinions, the requirement to filter or remove insects from a mixture is Rabbinic in nature, and – just as with *davar sheyesh lo matirim* – there is a limit as to how much the person must do to satisfy this requirement.⁵³ All reasonable steps must be taken to remove the *issur*, but if doing so involves unusual amounts of difficulty or expense, the person may rely on *bitul* and does not have to remove the *issur*. On the other hand, the first opinion holds that the need to remove the *issur* is essentially a *Torah*-based halacha, and one must go to any lengths to fulfill the requirement.

Our case appears to be a perfect example of where these opinions would differ; it is physically possible to remove the insects and covers from the mixture but it truly takes a considerable amount of effort to do that. First the juice must be filtered with a 230 mesh cloth, and then one must painstakingly pick through the particulate to segregate the scale. According to the lenient/latter opinion, that effort is beyond what is expected for a *davar sheyesh lo matirim* and therefore the insects are “in a *ta’aruvos*” and *batel*. However, according to the strict opinion that a mixture only qualifies for *bitul* if there is absolutely no way to separate the *issur* from the *heter*, should the insects and covers in the juice be an example of that? Should we say that since it is possible to remove the insects, one is required to do so, and if one doesn’t they cannot claim that the insects are *batel* in the juice?

This question was posed to a number of contemporary *Poskim* who essentially all agreed that – although in general one should be *machmir* for the strict opinion noted above – in this case one is not required to do so. The basic reason for this was that for the average person it is truly impossible to remove the insects, and there are so few people who have the expertise to find and remove these insects from the juice that it is as if there is no way to remove them. Some of the nuances of how different *Poskim* said this, are presented in the footnote.^{54 55}

⁵³ See, for example, *Shulchan Aruch* 102:2 & 4.

⁵⁴ Rav Shmuel Felder (personal conversation with the author) and Rav Moshe Heinemann (as reported by Rabbi Sholom Tendler) said that one is not required to learn the special skill required to identify and remove the insects from the juice. [At the same time, Rav Felder was of the opinion that removing covers from the juice is a skill that anyone can easily learn with a minimal amount of training (others questioned this assumption). Therefore, according to those who consider covers to be forbidden as *yotzeh* (see Section H of this document), the covers are not *batel* since they are removable from the mixture.]

Rav Shlomo Miller (as reported by Rabbi Feingold) based his position on a question: if the halacha is that anything removable is not *batel*, what is the case where a *berayah* is not *batel*? Clearly the *berayah* must be mixed in a manner where it is considered a *ta’aruvos*, yet the insect must be complete to qualify as a *berayah*. If so, how is it possible that a complete insect cannot be removed even with herculean means? [Although one could possibly answer that *berayah* is not *batel* when the insect is so perfectly camouflaged as to be impossible to remove, Rav Miller was uncomfortable limiting the halacha of *berayah* to such a specific and limited case.] This indicates that even within the opinion that one must do “anything” to remove the insect, there is some limit to “anything”. Although the exact guideline as to what the extent of “anything” is, Rav Miller was convinced that the effort required to remove the exceedingly small insects from orange juice was beyond what is required.

See also *Bedikas Hamazon K’halacha* Volume 1 Page 134 (end of first note) for a similar ruling from Rav Elyashiv.

Rav Asher Anshel Eckstein writes in his *teshuvah* on the topic that even after experts remove the suspected insects from the juice, they find that more than half of what they’ve removed is actually not an insect, such that the insects remain (in a *ta’aruvos* and) are *batel* in the non-insects. Although Rav Eckstein presumably is aware that there are a handful of experts (at least 4 of which are known to this author) who can actually identify and isolate just the insects and covers, the underlying assumption of the *teshuvah* is that one can ignore this possibility since the expertise of those individuals is deemed insignificant.

⁵⁵ An alternate reason to be lenient was suggested by Rabbi Boruch Moscovitz (author of *Vedebarta Bam*) (as reported to this author by Rabbi Dickman, and as presented in a somewhat different manner by Rav Nissim Kaplan, of *Yerushalayim*, in a recorded *shiur* in January 2015). One violates an *issur d’oraisah* for eating an insect if they (a) eat a *kezayis* of insects, (b) eat a whole insect (*berayah*), or (c) if they eat less than a *kezayis* of a partial insect, but that partial insect qualifies for the principle that התורה אסור מן התורה חצי שיעור אסור. Clearly, no one will possibly eat a *kezayis* of insects in their orange juice (“a”), and we have already established that the insects are not *berayos* (“b”), such that the only possible *d’oraisah* violation is based on the assumption that these qualify as התורה אסור מן התורה חצי שיעור אסור. In this regard, one can rely on the opinions that when a חצי שיעור is mixed with other foods (even if those don’t technically qualify as a “*ta’aruvos*”) there is no *d’oraisah* violation. [For more on that, see *Chavos Da’as* 109:5 (*Biurim*) and the many opinions cited in *S’dei Chemed* Volume 2 pages 372-375 (כלל ט"ו).] If so, a person drinking orange juice with insects in it is (at most) only



Conclusion

It is physically possible to remove the insects from the juice, but due to the extreme difficulty in doing so the mixture of juice and insects is considered a ta'aruvos such that bitul remains appropriate. Although many Poskim disagree with the aforementioned approach as relates to most mixtures, in the case of orange juice were there are a mere handful of people who can actually remove the insects, all should agree that the insects are batel.

L. Summary

The outside of orange peels harbor tiny scale insects, and these insects together with their covers, can be found in containers of orange juice. There are two primary reasons why the juice might nonetheless be permitted: the insects may be too small to be forbidden, or they may be *batel* into the juice. There are many prominent *Poskim* who disagree with the first of these reasons, but there seems to be agreement that the second reason is valid. Although at first glance one might think that *bitul* is inappropriate due to the insect being a *beryah* or being “removable” from the mixture, further analysis shows that this does not appear to be correct, and orange juice is therefore permitted.

violating an *issur d'rabannan*, and to avoid an *issur d'rabannan* the person is not required to make the strenuous efforts required to segregate insects from the juice (as above regarding *davar sheyesh lo matirim*).

