



AUTHENTIC TECHEILES

*A Balanced, Concise Analysis of the Murex Trunculus as a
Candidate for Techeiles*



BY RABBI NOSSON DUBIN

© 2022 Nosson Dubin
All rights reserved
Rabbidubin@kosherinstitute.com

Available for Purchase on Amazon.com

THE AUTHENTIC CHILAZON

COMMANDMENT

We are commanded by the *Torah* (Bamidbar 15:38) to place strings of *Tzitzis* with a strand of *Techeiles* on our four cornered garments. *Techeiles* is a string of white wool dyed blue using a special dye obtained from a creature known as the *Chilazon*.

WHEN WAS IT LOST?

It is not abundantly clear when the identity of the *Chilazon* became lost. The latest reference of someone possessing *Techeiles* was during the time period of Rav Achai¹ - a member of the *Rabanan Savorai*², who lived until approximately 510 C.E. It seems from the *Gemara* that even during that time it was already a novelty. We also know that the *Medrash Tanchumah*³ - written approximately in the year 750 C.E. - writes that *Techeiles* was *Nignaz* [hidden] and unavailable.

It would therefore seem that the identity of the *Chilazon* was known, and the *Mitzvah* of *Techeiles* was practiced, well after the destruction of the Bais Hamikdash, through the period of the *Amoraim*, and lost sometime between the years 510 and 750 C.E.

¹ Gemara Menachos 43a.

² Shem HaGedolim, Aleph, 145

³ Shelach Siman 15. This idea is mentioned in Medrash Rabbah [Shelach Siman 17] as well.

RADZHINER *TECHEILES*

Throughout the past 130 years, three attempts to identify the *Chilazon* were made. The first was by the Radzhiner Rebbe, Rabbi Gershon Chanoch Henoch of Radzhin. In the year 1887 he published a *Sefer* discussing all the references in *Chazal* to the *Chilazon* and the *Techeiles* dye produced from it. In this *Sefer* he compiled a list of characteristics that can be used to identify the *Chilazon*. In 1888 he traveled to the world-famous aquarium in Naples, Italy, and spent many months researching all the different marine species that may potentially match these descriptions. He concluded that the Cuttlefish fulfills all the necessary criteria and published another *Sefer* proving his hypothesis. Close to fifteen thousand people began wearing *Techeiles* produced from the Cuttlefish.

RABBI HERZOG'S REJECTION

In the year 1913 Rabbi Yitzchok Issac Herzog (Chief Rabbi of Israel from 1936 – 1959), wrote his doctoral dissertation on *Techeiles*. In this work he conclusively demonstrated that the Cuttlefish cannot be a candidate for *Techeiles*, and the Radzhiner *Techeiles* was almost universally rejected.

RABBI HERZOG'S PROPOSAL

Rabbi Herzog himself suggested that it may be the *Janthina* snail. This proposal was never accepted or produced and was subsequently disproven as well.

MUREX TRUNCULUS

In recent years there has been a movement to establish that the authentic *Chilazon* is the *Murex Trunculus* snail found in the Mediterranean Sea in

Northern Israel. There are a few indications that this may be the long lost *Chilazon*, as follows:

- A. The *Gemara*⁴ indicates, and Chazal⁵ write, that the *Techeiles* dye is a colorfast blue. Murex dye can be produced in a manner that it will be blue and permanent.
- B. *Chazal* tell us that there is another blue dye, *Kala Ilan*, that is completely identical in color to *Techeiles*. *Kala Ilan* seems to be translated by the *Rishonim*⁶ as the Indigo plant, and the chemical makeup of plant indigo and Murex dye is completely identical.
- C. Rashi⁷ and other *Rishonim*⁸ describe the *Chilazon* as a worm. This corresponds well with the Murex snail, which is essentially a worm inside a shell. Furthermore, the word for snail in several Middle Eastern languages is some variation of “Chilzon”.
- D. The area where the Murex is presently found is the exact location of the *Chilazon* described in the *Gemara*. Additionally, huge mounds of broken Murex shells broken in the manner used to extract the dye were found in these locations as well, indicating that these areas produced dyes from the Murex⁹.
- E. Secular historical sources refer to the Murex as *Porfura*, and we find several *Midrashim* that refer to a royal garment of *Techeiles* as *Purphyra*. This would seem to indicate that the *Techeiles* was produced using the Murex snail.

⁴ Menachos 42b.

⁵ Hilchos Tzitzis 2:1.

⁶ Aruch [entry *Kala Ilan*]

⁷ Sanhedrin 91a.

⁸ Ravyah, Shabbos 194.

⁹ One can argue, though, that although it is obvious that these areas produced dyes from the Murex, this doesn't prove that they produced a blue dye for *Techeiles*

[Critics respond that all these Midrashic references all refer to royal garments made from *Techeiles* but may not have been from *Chilazon* origin.]

- F. The Chavos Yair, Shiltei Gibborim and some others state clearly that the *Techeiles* is produced from the Purpur (Murex).

PRODUCTION OF THE DYE

The method for producing this *Techeiles* is as follows. Baskets with dead fish as bait are lowered to the ocean floor. A few days later these baskets are raised, and the snails collected. The shells are broken open opposite the hypobronchial gland containing mucus. Throughout the production of the dye, it undergoes a number a color changes. The mucus starts out clear, and subsequently turns yellow green and ultimately purple. Recently it has been discovered that if after immersing the wool into the purple dye it is exposed to sunlight, the color changes to blue.

*AN ANALYSIS OF THE DESCRIPTIONS
MENTIONED IN CHAZAL*

The *Gemara* and *Rishonim* provide various descriptions of the *Chilazon*. The following section will consider the various approaches explaining these sources.

1. THE DYE PRODUCED FROM THE
CHILAZON IS A SHADE OF BLUE
RESEMBLING THE YAM (LIT. SEA), SKY,
AND SAPPHIRE. [CHULLIN 89A]

The Murex seems to fit this criterion well; the color of the wool after being exposed to sunlight is a dark blue.

2. *GUFO DOMEH LIYAM – THE CHILAZON* LOOKS SIMILAR TO THE SEA. [MENACHOS 44A]

Critics: At first glance, the Murex does not seem to meet this criterion. The body of the Murex is a whitish color, and the shell is light brown, neither of which resembles the sea.

Proponents: Two explanations are suggested to reconcile this difficulty. One possibility is that the Hebrew word “Yam” can also mean seabed and the shell of the Murex is brown, similar to the seabed. Others explain that the Murex is often covered in sea fouling which gives it a green appearance, similar to the sea¹⁰.

Critics: Both of these proposals seem problematic because the *Gemara* uses the same terminology (*Domeh Le’yam*) to describe both the *Chilazon* and the *Techeiles* itself, and since in regard to the color of the *Techeiles* everyone agrees that we are referring to the sea and that the color is blue, it is reasonable to assume that in regards to the *Chilazon* it would be the same - it is being compared to sea not the seabed, and that the color is blue and not green.

Additionally, the second explanation is difficult because the actual creature is clearly brown and the *Gemara* wouldn’t say *Gufu Domeh Le’Yam* when in truth the green color is only a result of the algae adhered to it. Furthermore, the algae cover everything in the sea and would not be a unique characteristic of the Murex.

¹⁰ Sefer Levush Ha’Aron pg. 71.

3. *U'BRIASO DOMEH LIDAG* – ITS PHYSICAL MAKEUP RESEMBLES A FISH. [MENACHOS 44A]

Critics: The Murex is not a fish, nor does it resemble one.

Proponents: If one were to trace the outline of the Murex it would resemble the shape of a fish¹¹. Others explain that *Briaso Domeh Le'Dag* doesn't mean that's its form is similar to a fish, like Rashi and Rabbeinu Gershom, rather its creation is resembles a fish because it spawns like fish.

Critics: Both explanations are clearly not the simple interpretation.

¹¹ Levush Ha'Aron pg. 72.

4. IT GETS WASHED ASHORE ONCE IN SEVENTY YEARS AND IS EXPENSIVE BECAUSE OF ITS INFREQUENT APPEARANCE. [MENACHOS 44A]

Critics: The Murex is always available at the bottom of the sea. Additionally, we are not aware of rare occurrences of it being washed ashore.

Proponents: The Radvaz¹² explains that the *Chilazon* was always available on the ocean floor. The *Gemara* that seems to imply that it was washed ashore every seventy years, was referring to a miraculous mass surfacing that occurred once every seventy years. He explains that this incredible phenomenon only happened while the *Bais Hamikdash* was standing.

¹² Vol. 2, responsa 685.

5. IT IS FOUND IN THE WATERS BETWEEN
TZUR (TYRE) AND *CHAIFA* (HAIFA).
[SHABBOS 26A]

Proponents: This corresponds remarkably well with the Murex, which is found in the Mediterranean, precisely in this location.

6. IT WAS FOUND EXCLUSIVELY IN THE AREA OF *ERETZ YISROEL* BELONGING TO *ZEVULUN*. [MELILLA 6A]

Proponents: The western border of *Zevulun* was along the Mediterranean up until *Tzidon* which was near *Tzur* (Tyre). This is clear from the *Pasuk* in *Parashas Vayechi* (49:13) *Zevulun Lichof Yamim Yishkon, Ve’Hu Le’Chof Anios, Viyarkaso Al Tzidon*. Additionally, the *Sefer Kaftor Vuferach* clearly places *Zevulun* along the Mediterranean shore.

Critics: The *Pesukim* in *Sefer Yehoshua* do not give any indication that they bordered the Mediterranean.

The commentators discuss how to reconcile the *Pesukim* in *Sefer Yehoshua* with the *Pasuk* in *Vayechi*. Some say that although they did not border the coast, they were the seafarers and merchants and therefore described as living along the coast.

The *Gra* explains that most of their territory was not coastal besides for a small portion in the northern region. However even according to the *Gra* that they did have some coastal presence, that would not explain why they were the exclusive producers of *Techeiles*.

7. THE *CHILAZON* IS REFERRED TO AS
SEFUNAI TEMUNAI CHOL (HIDDEN
TREASURES OF THE SAND). [MEGILLAH
6A]

Proponents: The Murex lives on the sand and at times buries itself in the seabed, so it would seem to fit this description.

8. IT WAS CAPTURED USING NETS. [SHABBOS 74B]

Critics: There would seem to be no logical reason to use nets to trap slow moving snails found on the ocean bed.

Proponents: Historical sources, such as Aristotle and Pliny¹³, discuss harvesting the snails by lowering baited wicker baskets on to the ocean floor and subsequently raising them. It would be reasonable to assume that this can be accomplished doing the same with a net.

¹³ Quoted in Levush Ha'Aron pg. 78.

9. ONE WHO CATCHES A *CHILAZON* ON *SHABBOS* HAS TRANSGRESSED THE *MELACHAH* OF *TZOD* (CAPTURING). [SHABBOS 75A]

Critics: The *Gemara* (Shabbos 106b) states that the *Melachah* of *Tzod* does not apply when the creature can easily be grabbed without any effort. One example of this is trapping grasshopper during a locust plague, where one need only to lay his hand on one of them. Therefore, in regard to the *Murex*, since it is an extremely slow-moving creature and no effort is required, one would not transgress the *Melachah* of *Tzod*.

Proponents: Rashi (Beitzah 24a) states that any creature that requires a net for its capture is included in the *Melachah* of *Tzod*. This concept is brought in *Shulchan Aruch* (497:7) as well. *Murex* snails are often captured using baskets and the like and therefore would fall under this category.

Critics: It would seem to me that this concept should not be applied to *Murex* because although traps are often used in their capture it is completely unnecessary, and one can easily capture each individual one by hand. As a matter of fact, the organization *Petil Tekhelet* offers marine tours where you can dive to the shallow ocean floor and retrieve the snails by hand.

10. IMMEDIATELY AFTER THE
CHILAZON DIES THE QUALITY OF THE DYE
STARTS TO DETERIORATE, THEREFORE,
AN EFFORT WAS MADE TO EXTRACT THE
DYE FROM THE *CHILAZON* WHILE IT WAS
STILL ALIVE. [SHABBOS 75A]

Proponents: The enzyme required for the dye production quickly decomposes upon the death of the snail, and the glands containing the dye need to be crushed while the snail is alive or shortly afterwards. Experiments show that as soon as two hours after the snail's death the dye quality is severely degraded.

Furthermore, we see clear historical references to this property of the Murex in the works of Aristotle and Pliny the Elder.

Critics: The *Gemara* clearly says that effort was made to extract the dye while the *Chilazon* was still alive; if indeed the dye does not deteriorate until two hours after death there would be no reason to make an attempt to keep the snail alive, even if the snail were to die the dye extraction takes a mere minute or two and the dye quality would not be negatively affected.

Also, a careful examination of the writings of Aristotle and Pliny reveal that the reason there was a stress on keeping the Murex alive was to prevent it from discharging its dye, and not because of a deterioration of dye quality¹.

11. THERE WAS PLANT-BASED DYE
(INDIGO) WHICH CLOSELY RESEMBLED
THE *CHILAZON* DYE AND WAS
SIGNIFICANTLY MORE INEXPENSIVE.
[BABA METZIAH 61B]

Proponents: This one of the strongest proofs that the Murex is the authentic *Techeiles*. The chemical compound of the *Techeiles* dye produced from the Murex and from plant indigo is exactly the same, $C_{16}H_{10}N_2O_2$, and therefore produce the exact same color.

12. A CHEMICAL TEST IS DESCRIBED BY THE *GEMARA* TO DIFFERENTIATE BETWEEN THE TWO DYES. WHEN BOTH DYES ARE SUBJECTED TO THIS TEST, THE PLANT-BASED DYE WILL FADE AND THE *CHILAZON*-BASED DYE WILL NOT.
[MENACHOS 42B]

Critics: This is one of the strongest proofs disproving the Murex as a *Techeiles* candidate. If the chemical makeup is exactly the same, then any chemical test conducted on one would produce identical results and would be largely impossible to differentiate between them based on the chemical test depicted in the *Gemara*.

Proponents: The method of causing a dye to bond with wool involves a process known as reduction. This is accomplished by introducing certain chemicals into the dye vat. Plant indigo contains a larger amount of indirubin which makes the dye more difficult to reduce and would therefore not bond to the wool quite as well. So, although today with advance dyeing developments the indigo produced by plant and snails is virtually identical, in the times of *Chazal* the plant indigo was not as colorfast as snail indigo.

13. THE YERUSHALMI STATES THAT
THE *CHILAZON* HAS *GIDDIM* AND
ATZAMOS (SINEWS AND BONES).
[SHABBOS 1:3]

Critics: The Murex snail clearly does not have sinews or bones.

Proponents: We can suggest that the bones mentioned refer to its protective hard shell, and the sinews are the ligaments that attach the snail to its shell.

14. THE *CHILAZON* HAS A *NARTIK*
(POUCH/SHELL) THAT GROWS ALONG
WITH IT. [PESIKTA D'RAV KAHANA 11 –
VAYEHI BESHALACH 21]

Proponents: This is an accurate description of the Murex which has an external shell that grows along with it.

15. CHAZAL [TZITZIS 2:1] WRITE THAT
THE DYE MUST BE COLOR-FAST AND
PERMANENT.

Proponents: The dye produced from the Murex is extremely colorfast and permanent.

16. CHAZAL'S DESCRIPTION OF THE
CHILAZON IS AS FOLLOWS: 1. IT IS A FISH;
2. *DOMEH EINO LI'AIN HAYAM*; 3. ITS
BLOOD IS BLACK LIKE INK; 4. IT IS FOUND
IN THE *YAM HAMELACH*.

Critics: Chazal's *Chilazon* description is exceedingly difficult to reconcile with the Murex. His description of *Chilazon* as a fish is problematic because the Murex is definitely not a fish. Furthermore, even if we would somehow suggest that "fish" refers to all marine life as fish for lack of a better term, shortly afterwards in regard to something else, Chazal use the term *Shavlul*, which is the Hebrew word for snail. If the *Chilazon* is indeed a snail, Chazal would have used a more accurate description of *Shavlul* instead of *Dag*.

I posed this question to the author of one of the most prominent *Techeiles Seforim*. He responded that he feels that the word *Shavlul* is limited to a land snail. He did not provide a source to such a differentiation. Additionally, it still would have been more accurate for Chazal to write *Shavlul De'Yami* instead of *Dag*.

Chazal also tell us that the blood of the *Chilazon* is black like ink. The Murex dye starts off as clear and goes through a number of color changes until it ultimately turns blue, but at no point is it black.

Proponents: If the dye is left for too long it turns black. Also, the black color of the Murex dye is described by writers of his time as black, so it obviously was perceived as suchⁱⁱ.

(Rabbi Herzogⁱⁱⁱ suggests that considering it is unlikely that Chazal ever encountered *Techeiles*, and we know of no Jewish source that provides a similar description, he may have based this criterion on Aristotle's writings.)

Critics: Chazal is describing the color of the dye when it is extracted from the creature, or maybe after it is prepared for dyeing, but definitely not depicting what it would look like if you were not to use it for dyeing.

17. TOSAFOS QUOTES RABBEINU TAM
THAT THE GLAND CONTAINING THE DYE
IS *MIFKAD PAKEID* (CONTAINED IN A
SEPARATE AREA SEPARATE FROM THE
LIFE BLOOD OF THE CREATURE).
[SHABBOS 75A]

Proponents: This is true of the Murex. The mucus used for the dye is found in the hypobronchial gland, separate from the rest of the snail.

18. THE MIDRASH STATES THAT THE
TECHEILES WAS *NIGNAZ* (HIDDEN).
[MIDRASH RABBAH SHELACH 17;
TANCHUMAH SHELACH 29]

Critics: Rav Elyashiv, Rav Chaim Kanievski, Rav Moshe Shternbuch, Rav Shlomo Miller quote these *Midrashim* as a conclusive source that the authentic *Techeiles* will not return until the coming of Moshiach.

Proponents: There are implications in different *Achronim* (Maharil, Radvaz, and others) that seem to say that its theoretically possible to obtain *Techeiles* even in contemporary times. Therefore, we must say that these Midrashim only mean that it was hidden for a limited amount of time, but do not negate the possibility of locating it before *Moshiach's* arrival.

Critics: When Rav Chaim Kanievski was asked about the implications from these *Acharonim*, he responded *Ain Raayos Beruros, U'moshiach Im Yirtzeh Hashem Yavee Ha'Techeles*.

19. THE ARIZAL WRITES THAT THE
TECHEILES IS ONLY AVAILABLE WHEN
THE BEIS HAMIKDASH WAS STANDING.
[SHAAR HAKAVANOS INYAN TZITZIS
DERUSH 4, PAGE 6A]

Critics: The Arizal is quite clear that the *Mitzvah* of *Techeiles* is presently nonexistent.

Proponents: The *Gemara* states that there was *Techeiles* in the time of Rav Achai. Rav Achai lived at the end of the Ammoraic period, 500 – 800 years after the *Bais Hamikdash* was destroyed. Therefore, we cannot take this statement at face value because it doesn't seem accurate, and we must assume that there is a deeper understanding to his words.

SAFEK DIORAYSA LICHUMRA

Since there is a reasonable possibility that this may be the authentic *Chilazon*, we should therefore apply the Talmudic dictum of *Safek Dioraysa Lichumra* and wear it out of doubt. Is there any reason a person should refrain from obtaining *Techeiles*? It seems there may be a few potential reasons:

1. The Arizal writes that one who puts Kalah Illan (plant indigo) on his garment gives the *Satan* a grasp on him. The indigo produced from the Murex is identical to plant indigo, it would seem that the warning of the Arizal may apply here as well.
2. The Mishnah Berurah quotes a Pri Megadim that requires the color of the Tzitzis strings to be identical to the garment.
3. Even if we were to assume that the Murex is indeed the authentic *Chilazon*, there are unresolved disputes among the *Rishonim* in regard to *Techeiles* production and to the number of *Techeiles* strings to be placed on each corner. Since we don't have a Halachic precedent in regard to these discussions we cannot produce or don the *Techeiles*.

SUMMARY

We have presented the possibility of the Murex snail as a candidate for the *Chilazon*. There are several Talmudic statements that corroborate this proposal. Additionally, there are some geographical and linguistic proofs for this idea.

There are also numerous other sources that seem to contradict this claim, some of them have satisfactory explanations, and others not.

ⁱ Pliny: "It is a great point to take the fish alive, for when it dies it spits out this juice."

Aristotle: "Fishermen are anxious always to break the animal in pieces while it is yet alive, for if it dies before the process is completed it vomits out the bloom."

ⁱⁱ Pliny: "This secretion consists of a tiny drop contained in a white vein, from which the precious liquid used for dyeing is distilled being of the tint of a rose **somewhat inclining to black.**"

Aristotle: "There are many species of the purple murex; ... in most of them the peculiar bloom from which their name is derived **is dark to blackness...** Further, as a general rule, in northern waters **the bloom is blackish.**"

ⁱⁱⁱ Herzog doctorate page 155.