



Historical Review of Tekhelet and the Hillazon

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<i>Date</i>	<i>Event/Find</i>	<i>Description</i>
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Ancient	1750 BCE	Crete	The archaeological evidence now available suggests that the origins of the purple and blue dye industry can be traced to Crete.
	1500 – 1300 BCE	Tell-el-Amarna Tablets	The phrase <i>subatu sa takilti</i> - a garment of <i>tekhelet</i> - is listed as one of the precious articles sent to Egypt by Dusratta, King of the Mittani, as dowry to the Egyptian prince who was about to marry his daughter.
	1200 BCE	Tel Shikmona Vat	Chemical analysis of dye stains on an ancient vat are found to be molecularly equivalent to dye from Murex snails.
	1200 – 900 BCE	Canaanite Coast	The vat from Tel Shikmona, together with various other archaeological finds at numerous sites, reveals an advanced dye industry using Murex snails established on the Canaanite coast.

Loss	100 BCE – 68 CE	Dye Use Restriction.	Caesar (100-44 BCE) and Augustus (63 BCE -14 CE) restricted the use of the dyes to governing classes. Nero (37-68 CE) issued a decree that gave the emperor exclusive right to wear purple or blue garments.
	337 – 383 CE	Dye Use Restriction.	Under Constantius (337-362) the restrictions against the use of <i>tekhelet</i> were strictly enforced. An edict (383) by Gratian, Valentinian, and Theodosius made the manufacture of higher quality purple and blue a state monopoly.
	550 CE	Last Use of Dye by Jews	The Talmud (<i>circa</i> 550) - The Talmud tells of <i>tekhelet</i> being brought from Israel to Babylon in the days of R. Ahai (506) - the last positive indication of the use of <i>tekhelet</i> . One can assume that <i>tekhelet</i> was available until the redaction of the Talmud, as no reference to its discontinuance is recorded.
	639 CE	Demise of Dye Industry	The Arab conquest of Israel is believed to have brought an end to the snail source dyeing industry in Israel.
	750 CE	Lament at no <i>Tekhelet</i>	The Midrash Tanhuma laments “and now we have no <i>tekhelet</i> , only white.”

Rediscovery	1500 – 1685	Early Research in Mollusk-based Dyes	Guillaum Rondelet (d. 1566) was the first to identify Pliny's <i>purpura</i> with the species <i>Murex brandaris</i> . Fabius Columna (1616) suggests <i>Murex trunculus</i> as having been utilized in the ancient dyeing process. William Cole (1681) noted that a colorless fluid in the hypobranchial gland of marine mollusks (<i>Purpura lapillus</i>) found off the coast of Britain was converted to a red color on exposure to light, thus revealing the sensitivity of mollusk-based dye to light.
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1857	Discovery of Dye Snails	French zoologist Henri de Lacaze -Duthiers discovered three dye-producing snails in the Mediterranean: <i>Murex brandaris</i> , <i>Murex trunculus</i> and <i>Thais haemastoma</i> .
1864	Discovery of Dye Industry	At Sidon, massive mounds (hundreds of yards long and several yards deep) of <i>Murex trunculus</i> snails were found. The shells were broken in the spot that gives access to the glands from which the dyestuff is obtained. At some distance, a separate and distinct massive mound of <i>Murex brandaris</i> and <i>Thais haemastoma</i> was found. Since a reddish-purple dye is most readily obtainable from the <i>Murex brandaris</i> and <i>Thais haemastoma</i> as opposed to the bluish-purple obtained from the <i>Murex trunculus</i> , Egyptologist A. Dedekind (1898) viewed this fact as undeniable proof that <i>Murex trunculus</i> was the snail used exclusively for <i>tekhelet</i> (blue), and the others for <i>argaman</i> (purple); Rav Herzog concurred.
1888	Radzyner Rebbi	Pioneered a quest for <i>tekhelet</i> which led to the isolation of a certain type of squid (<i>Sepia officinalis</i>) as its source. Subsequent chemical analysis identified the dye as Prussian blue, the color of which derives from added chemicals and not from the squid itself. This is something the Rebbi himself would not have countenanced, as he writes: the color must be exclusively from the <i>hillazon</i> . The Rebbi's three books on the subject (<i>Sfunei Temunei Chol</i> , <i>Ptil Tekhelet</i> , <i>Ein HaTekhelet</i>) still serve as a basis for <i>halakhic</i> investigation.
1909	Discovery of DibromoIndigo	German chemist Paul Friedlander identified the chemical structure of the purple dye from the Murex snail as being 6,6'-dibromoindigo.
1913	Rabbinical Investigation	R. Isaac Herzog's doctoral thesis on <i>tekhelet</i> named the <i>Murex trunculus</i> as the "most likely candidate" for the source of <i>tekhelet</i> - except that, by using contemporary dyeing procedures, its dye was not pure blue.
1980	Discovery of Process to Obtain Blue Dye	Prof. Otto Elsner of the Shenkar College of Fibers in Israel discovered the secret of producing a pure blue color from the <i>Murex trunculus</i> snail, thus solving Herzog's most compelling difficulty. Together with Ehud Spanier of Haifa University, he investigated the photo-chemical properties of the <i>trunculus</i> dye and found that when the dye is in a reduced state (a prerequisite for dyeing wool), exposure to ultra-violet light will transform the blue-purple colorant (dibromoindigo) to unadulterated blue (indigo).
1985	Rabbi Eliyahu Tavger	While writing his book (<i>K'lil Tekhelet</i>) about <i>tzitzit</i> , R. Tavger became convinced that the source of authentic <i>tekhelet</i> had been in fact discovered. Determined to actualize his newfound knowledge, and after much trial and error, he succeeded in applying the process according to the <i>halakha</i> from beginning to end - thus becoming the first person since its loss to dye <i>tekhelet</i> for the ritual purpose of <i>tzitzit</i> .
1993	P'til Tekhelet	Together with R. Tavger, the <i>P'til Tekhelet</i> organization was formed to produce and distribute <i>tekhelet</i> strings, as well as to promote research and educational projects.

Sources:

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Dr. Baruch Serman, *The Science of Tekhelet, Tekhelet. Renaissance of a Mitzvah*, YU Press, 1996.

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