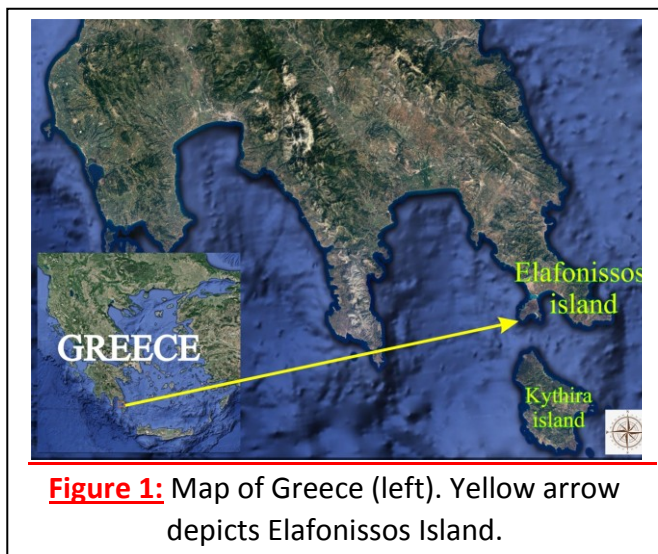


# There's still hope for *Saponaria jagelii*

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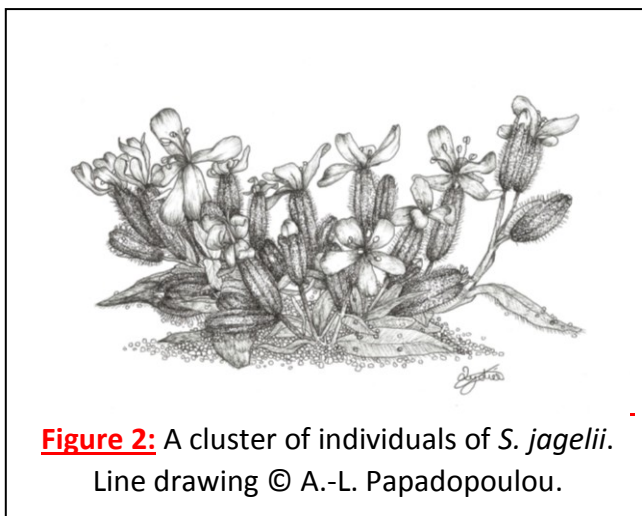
On the coastal dunes of Elafonissos Island (Fig. 1) the critically endangered (CR), Top 50 Mediterranean Island plant *Saponaria jagelii* Phitos & Greuter (Caryophyllaceae), a narrow endemic annual, is found. This species is confined only there, on “shifting dunes” [EU priority habitat 2120\* - shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)] (within the NATURA 2000 site GR2540002, just off the southeastern coast of Peloponnese) and, unfortunately, is currently losing ground dramatically.

A previous, 2019 field survey demonstrated that *S. jagelii* (Fig. 2) was growing in two distinctive sites (beaches) of Elafonissos. However, our team's visits for two consecutive years (2022 and 2023), did not detect a single individual of the smaller population (248 individuals in 2019), located at a beach highly accessible by visitors, tourists etc; thus we are afraid that the plant may have been lost from that site for good. On the other hand - and to our pleasant surprise - the largest population of *S. jagelii*, on the relatively hard-



**Figure 1:** Map of Greece (left). Yellow arrow depicts Elafonissos Island.

to-reach beach, was found thriving during our recent visit (April 1-3, 2023). In fact an individual plant census returned a somewhat (by 5%) higher value (ca 1520 individuals), compared to that of 2022 (ca 1440) and almost equal to the 2019 size (1567 individuals).



**Figure 2:** A cluster of individuals of *S. jagelii*.  
Line drawing © A.-L. Papadopoulou.

Furthermore, it is noteworthy that the population has expanded to some extent towards the sea, where a large number of individuals - not just clusters - were detected, although lots of litter (mostly dead, semi-decomposed aquatic plants and animals as well human garbage) washed ashore by the south winds, often cover part of the beach on which *S. jagelii* is accommodated (Fig. 3).



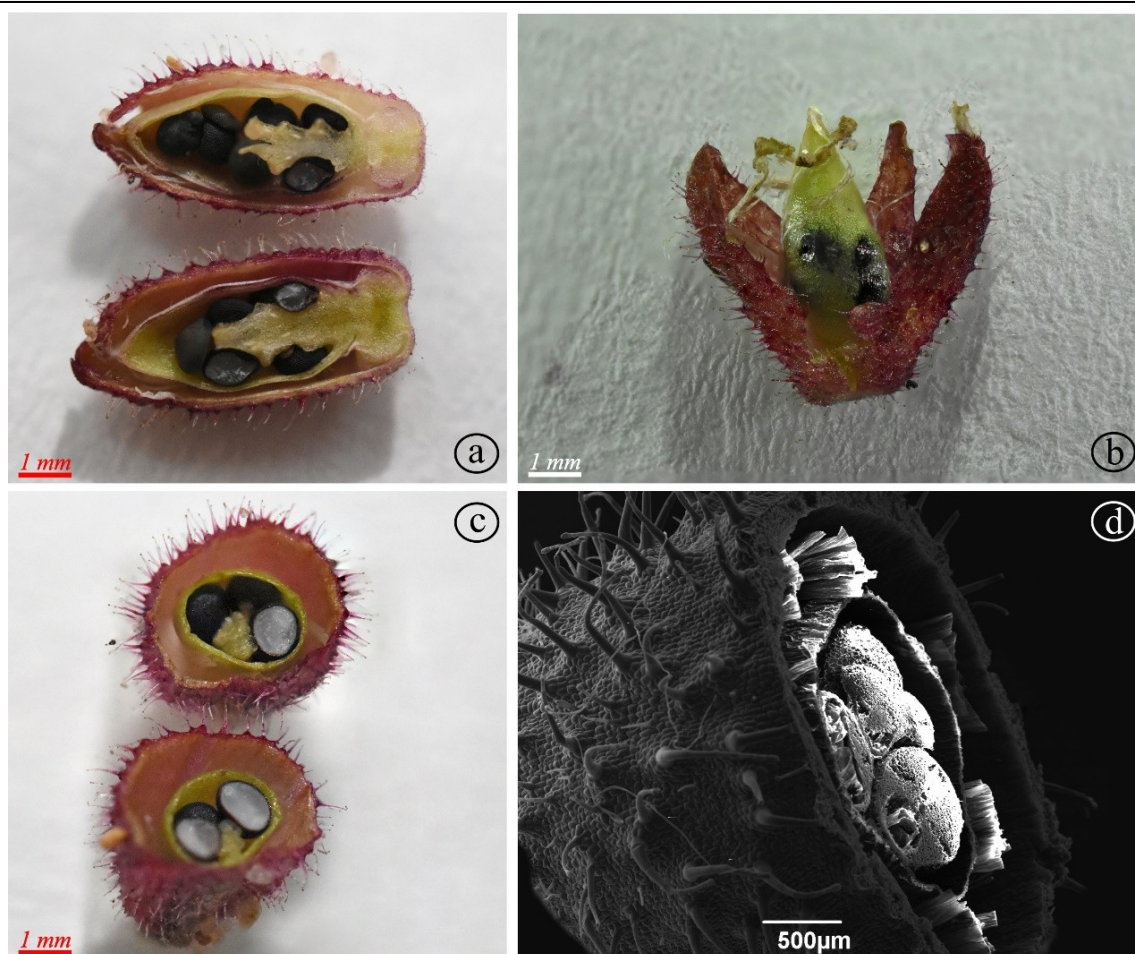
**Figure 3:** (a) *S. jagelii* cluster at the end of the flowering period (April 1-3, 2023). (b) Individuals of *S. jagelii* expanding their habitat. (c) Clusters of *S. jagelii*. [Photos: © Dr A.L. Stefi & NKUA Seed Bank]

Furthermore, data from previous year indicated that 10-20% of the entire subpopulation are growing within a private property while during the 2023 visit we counted only 4-5 individuals! Most frequently associated taxa with *S. jagelii* are: *Euphorbia paralias*, *Ammophila arenaria*, *Pancreatium maritimum* (with greater spatial spread than a year ago), *Matthiola tricuspidata*, *Medicago marina*, *Silene sedoides*, *Centaurea raphanina* subsp. *mixta* and *Anagallis arvensis*.

Our recent survey (April 1-3, 2023) coincided with the end of the flowering period. So we were able to collect 100 subcylindrical capsules with ripening seeds (around 10 seeds per capsule), for both research and long-term storage in our Seed Banks (NKUA and MSB Kew), in the framework of a satellite assignment to the “Conserving the Flora of the Balkans: Native Plants of Greece” Project (see [here](#) and [here](#)).

Closed, mature capsules were examined in the lab for the first time and offered new insight on the characteristics of this rare plant. Longitudinal and cross sections of capsules revealed five carpels, a free central placenta and about 8-12 seeds (Fig. 4 a,b,c). Numerous multicellular secretive hairs developing from a rosette-shaped basal structure can be observed all over the surface of the sepals (calyx) along with the diacytic stomata (Fig. 4d).

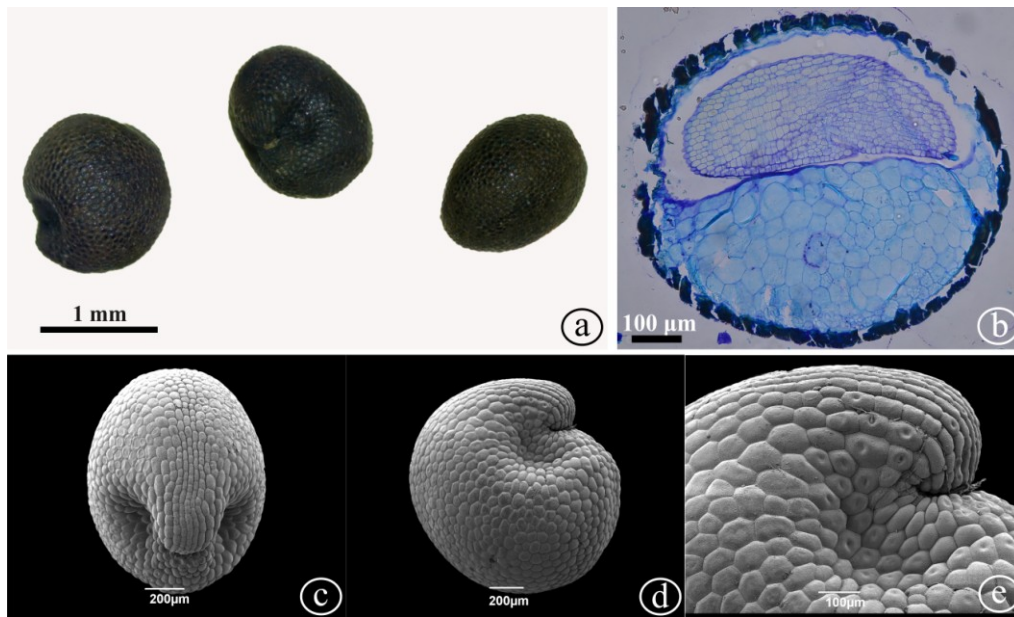




**Figure 4:** Microimages of *S. Jagelii*. (a) Longitudinal section of the mature fruit. Ovary, seeds, placenta are depicted. (b) A maturing ovary and the remnants of the stamen in a semi-developed fruit. (c) Cross section of the mature fruit. (d) Scanning Electron Micrograph (SEM) of a cross section of the mature fruit. [Photos: © Dr A.L. Stefi & NKUA Seed Bank]

The mature seed coat has a dark blue to black color, the seeds have the shape of a fictional ‘alien’ face (Fig. 5 a,b,c,d) and micropyle is easily distinguishable (Fig. 5e). {See also [here](#)}.

Having in mind that *S. jagelii* is a critically endangered species at a serious, imminent danger of habitat degradation and loss, we are temporarily relieved that the plant is still there thriving, its habitat somewhat expanded and its specialised pollinators, *Bombylius* sp., caught in action (Fig. 6). If it is any additional consolation, seeds collected in both 2022 and 2023 are now safely stored in our seed banks (NKUA & MSB) while a protocol of successful germination has been already elaborated. And all these lead us to conclude that the swan song of *Saponaria jagelii* (see [here](#)) is muted for the present.



**Figure 5:** Microimages of *S. jagelii* seeds. (a) Stereoscope dorsal and side views. (b) Cross section of an epoxy-embedded of a seed. The embryo, the seed coat and the endosperm can be distinguished. (c) and (d) 'Alien face' looking images of *S. jagelii* seeds, as viewed by Scanning Electron Microscope. (e) Detail of the micropyle.

[Photos: © Dr A.L. Stefi & NKUA Seed Bank]



**Figure 6:** A specific pollinator of *Saponaria jagelii* (*Bombylius* sp.) on duty, nectaring on the flowers. [Photo: © Dr A.L. Stefi & NKUA Seed Bank]