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The morphology of hairs in *Plantago famarae* Svent.

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Abstract

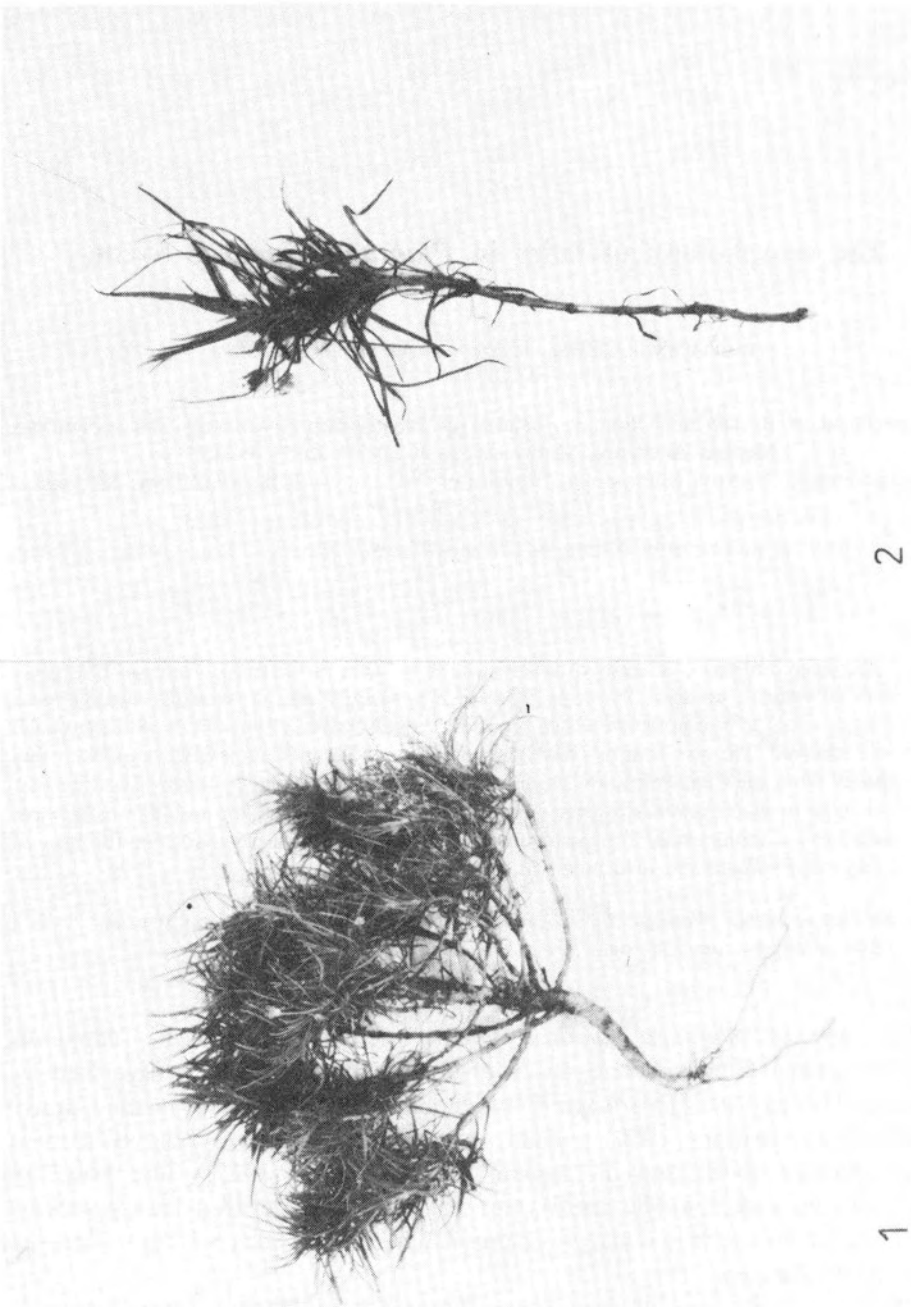
This paper is a part of a series of investigations on hairs in the genus *Plantago* L. It deals with an endemic taxon – *Plantago famarae* Svent. which has not been investigated yet in respect to hairs. The presence of two types of headless hairs and two types of headed hairs was observed. The results of this study are compared to those of another work on two other species from the Canary Islands. *P. famarae* does not differ from *P. arborescens* by either hair type or distribution. However, in contrast to *P. webbii* it has no web-like hairs while hairs with a multicellular stalk and unicellular head hairs (characteristic for the taxa of subgenus *Psyllium*) are distributed in a different way.

Key words: genus Plantago L., subgenus Psyllium (Juss.) Harms, sectio Psyllium (Juss.) Barn., Plantago famarae Svent., hairs, scanning electron microscopy

The species *Plantago famarae* Svent. (genus *Plantago* L., subgenus *Psyllium* (Juss.) Harms, sectio *Psyllium* (Juss.) Barn.) was first described by Sventenius in 1960. This taxon is an endemic dwarfish bush on the Canary Islands (Sventenius 1960) and grows together with two related species: *P. arborescens* Poir. and *P. webbii* Barn. (Pilger 1937). The hairs of *P. arborescens* and *P. webbii* are the topic of another paper (Andrzejewska-Golec and Świętosławski – in press). There have been no reports on the hairs of *P. famarae*.

Our plants were grown from seeds obtained from the Botanical Garden in Bayreuth. *P. famarae* grew well in our climate (it flowered in late autumn) but only until the first frosts which caused its death (Figs. 1, 2).

PLATE I



Figs. 1, 2. *Plantago famarae* Svent. A plant grown in our botanical garden: 1 – ×0.5, 2 – blossoming twig, natural size

Macroscopically, only scarce hairs on the rim of the leaf lamina were observed. They were multicellular headless hairs (Fig. 3C). It was also possible to observe by microscope that minute conical hairs (Fig. 3A, B; Figs. 5, 6) and minute headed hairs with a unicellular stalk and head divided vertically into two cells (Figs. 3D, 5, 6) were present on the leaf lamina. The latter two kinds of hairs could also be found on the stem (Fig. 3E-J). On the scape, however, numerous hairs with multicellular stalks and unicellular heads and less numerous conical hairs could be observed.

On the sides of the bract, hairs with unicellular heads and 1-3-celled stalks could be found (Fig. 4B). Such hairs were also found on the membranous part

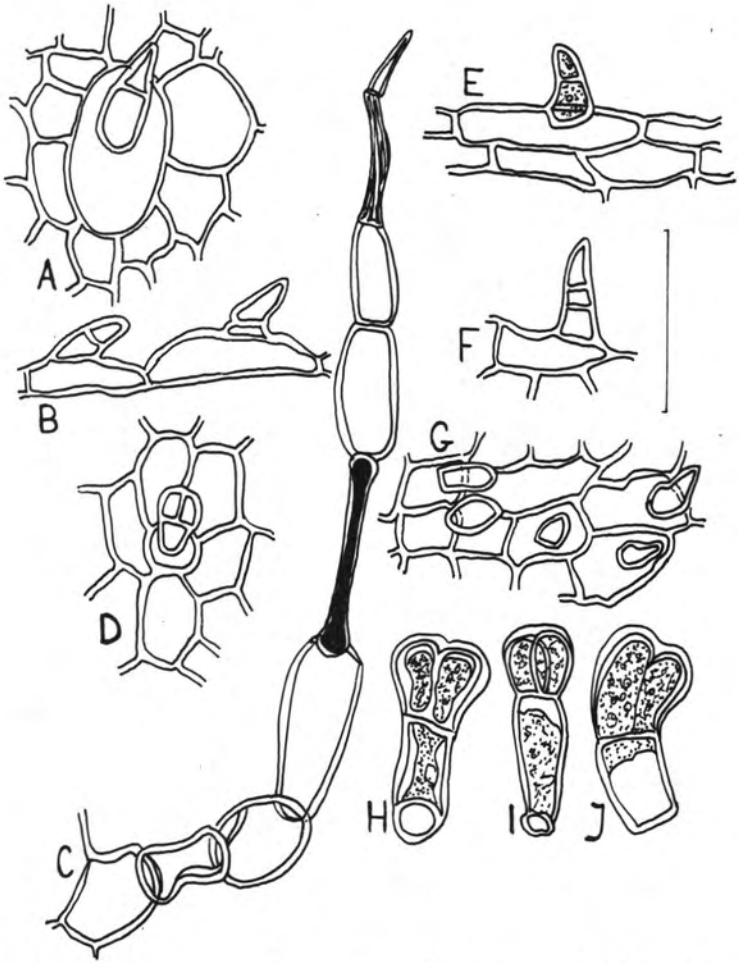


Fig. 3. *Plantago famarae* Svent. A-D – the hairs from a leaf: A-B – conical hairs, C – a headless hair from the rim of the leaf lamina, D – hair with unicellular stalk and two-celled head, E-J – hairs from a stem. Scale bar 0.1 mm; except C – 0.2 mm and H-J – 0.05 mm

of the bract, but they were much smaller. Conical hairs were found on the top of the bract (Fig. 4A).

Multicellular headless hairs could also be observed on the calyx (Fig. 4C, D), along with scarce multicellular hairs with a unicellular head (Fig. 4E) and

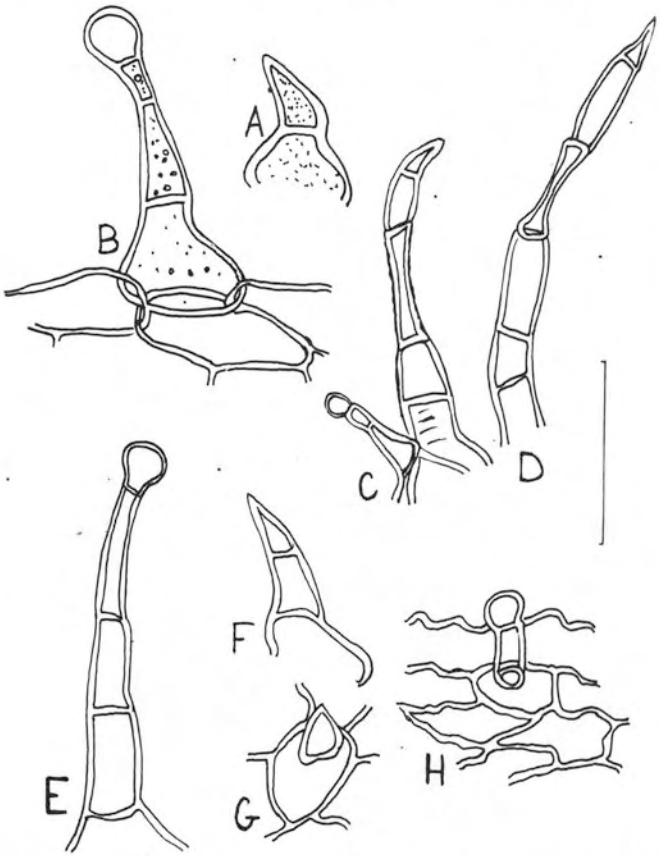


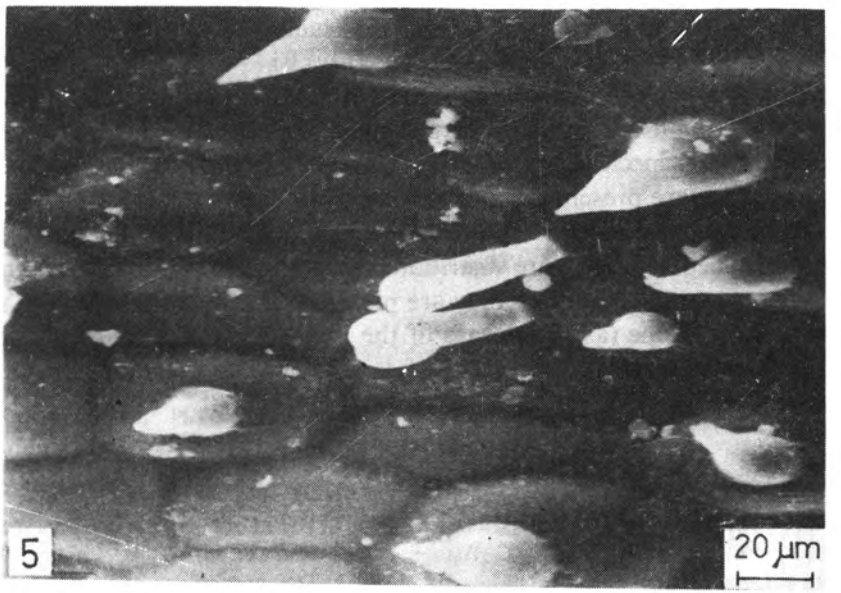
Fig. 4. *Plantago famarae* Svent. A, B – hairs from a bract; C-H – from a calyx. Scale bar 0.1 mm, except C-E – 0.2 mm

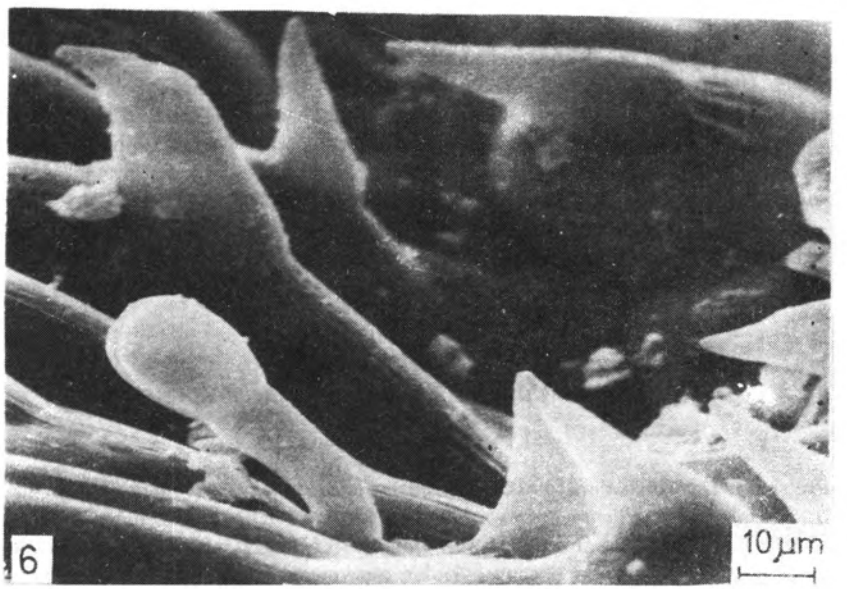
conical hairs (Fig. 4F, G). Hairs with a two-celled stalk and unicellular head (Fig. 4C) were more frequent and the most frequent were hairs with a unicellular stalk and unicellular head (Fig. 4H).

The corolla was almost naked, covered with very scarce hairs with three-celled stalks and unicellular heads.

Hairs with multicellular stalks and unicellular heads (Fig. 4B, C, E) are typical of the representatives of subgenus (section) *Psyllium* (Andrzejewska-Golec and Świętosławski – in press), while the representatives of the second subgenus – *Euplantago* Harms (*Plantago*) lack them (Andrzejewska-Golec and Świętosławski 1987, 1988, unpublished a, b).

PLATE II





Plantago famarae Svent. Fig. 5. Surface of the leaf lamina. SEM × 500. Fig. 6. Hairs from a leaf. SEM × 1000

Hairs with a unicellular stalk and head divided vertically into two cells (Figs. 3D, H-J, 5, 6) are present in the majority of sections of the genus *Plantago* (Andrzejewska-Golec and Świętosławski 1987, 1988). Comparison of the results of the present investigation of the hairs of *P. famarae* with the those of investigations on the hairs of taxon *P. arborescens* (Andrzejewska-Golec and Świętosławski – in press) permits the conclusion that the hairs of both taxa are very similar thus these taxa cannot be distinguished by hair morphology. The hair distribution of the two above-mentioned species is analogical. The same hair types as in *P. arborescens* and *P. famarae* are present in another Canarian taxon – *P. webbii*, where in addition web-like hairs can be found on the leaf base. Hairs with a multicellular stalk and unicellular head are distributed in a slightly different way than in *P. arborescens* and *P. famarae*, they are present not only on the rim of the leaf lamina and the scape (as in the case of the two species mentioned above) but also on the whole surface of the leaf lamina and the stem.

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Morfologia włosków Plantago famarae Svent.

Streszczenie

Praca stanowi część badań włosków przedstawicieli rodzaju *Plantago* L. Dotyczy ona endemicznego taksonu – *Plantago famarae* Svent., który do tej pory nie był pod tym kątem badany. Stwierdzono występowanie dwóch rodzajów włosków bezgłówkowych i dwóch rodzajów główkowych. Porównano wyniki obecnych badań z wynikami innej pracy dotyczącej również dwóch kanaryjskich gatunków: *P. arborescens* Poir. i *P. webbii* Barn. *P. famarae* nie różni się od *P. arborescens* ani typami włosków, ani ich rozmieszczeniem. Natomiast w odróżnieniu of *P. webbii* nie ma włosków pajęczynowatych, a włoski o wielokomórkowym trzonku i jednokomórkowej główce (włoski charakterystyczne dla taksonów podrodzaju *Psyllium*) są u niego inaczej rozmieszczone.