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SOME ANATOMICAL ASPECTS CONCERNING GLANDULAR AND NONGLANDULAR TRICHOMES PRESENTS ON *PEPEROMIA* SPECIES CULTIVATED OF BOTANICAL GARDEN OF IASI

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Summary: The present paper is focused on glandular and non-glandular trichomes of eight taxa from *Peperomia* genus. We point out the histo-anatomical features for each taxons by using MO and MEB methods.

Key Words: histo-anatomy, MO, MEB, glandular and non-glandular trichomes, *Peperomia*

Introduction

The studies of *Piperaceae* family members are very interesting especially because of their systematic position. The anatomical aspects found in the literature are referring only to a few *Peperomia* species and is focused on lamina features [1, 2, 6] and rarely point out the caracteristics of glandular trichomes [5]. In our country there are few morpho-anatomical observations upon the species belonging to this family [3, 7].

Material and method

The vegetal material is represented by the leaves and the stems of seven taxa who belongs to *Piperaceae* familiy: *Peperomia clusiifolia* (Jacq.) Hook., *P. clusiifolia* (Jacq.) Hook. '*Variegata*', P. obtusifolia (L.) A. Dietr., P. obtusifolia (L.) A. Dietr. 'Variegata', *P. orba* Bunting '*Astrid*', *P. serpens* (Sw.) Loud., *P. serpens serpens* (Sw.) Loud. '*Variegata*', and *P. verticillata* (L.) A. Dietr., cultivated in the greenhouses of the Botanical Garden of Iasi. The fixing and processing of the material was done according to the usual protocol of the Vegetal Morphology and Anatomy Laboratory belonging to the Biology Department of University "Al.I. Cuza" of Iasi.

The sections were made transversal at the middle level of the stem, petiole and lamina. As well as were made superficial sections at the leaf level. The obtained permanent preparations were analyzed and drawed at MC_1 optic microscope and photographed at the Novex optic microscope.

Micromorphological surface aspects of the stems and leaves was analyzed and photographed at the scanning electronic microscope (MEB) [8] with according to the usual procedure of the Electronic Microscopy Laboratory belonging to the Biology Department the University "Al. I. Cuza" of Iasi.

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Results

The morpho-anatomical synthesis, especially these signed by Metcalfe and Chalk [4], mention first of all the presence of glandular trichomes to the majority of members belonging to this family. It is a few information about the trichome structure.

For the studied species by us we have noticed the presence of both trichomes types: glandular and non-glandular, these are more frequently than the non-glandular ones. and in most of cases have a unicellular gland.

Among the most frequently met **glandular trichomes** we can mention the three cells trichomes, with the basis between the epidermical cells, an unistalked cell and the unicellular gland. This apical cells can be sac-like (in most cases) or spatula-like (sometime, in cases of *Peperomia serpens* taxa). The glandular trichomes are present on the aerial vegetative organs at all analyzed species, (less *P. verticillata*): at the level of leaf petiole (fig. **B**) and lamina (on both epidermis), but less numerous at the stem level (fig. **A**). These trichomes are disposed in a special way; they can be found among the epidermical cells, in genuine depressions, and the gland does not exceed the epidermis cells level (fig. **C**). At *Peperomia sepens* and its variegated leaves sort (fig. **D**) this glandular trichomes may have the unicellular gland at the same level with the epidermical cells or may be exceed.

At *P. verticillata*, on the stem (fig. **F**) and on the leaf, were observed glandular trichomes with the stalk and the head above the epidermis cells level.

The **nonglandular trichomes** have a slightly different structure. In general they are multicellular, uniseriate or even unicellular.

The multicellular, uniseriate non-glandular trichomes were met at the stem and leaf of *P. verticillata* (fig. **G, H. I**,), the leaf of *P. orba 'Astrid'* (fig. **J**) and on the leaf of *P. serpens* (fig. **K, L**). This last species has non-glandular trichomes disposed only in the lower epidermis and it was not observed at their variegated leaves sort. In the last case we can mention that basal cell which is slightly exceeded the epidermical cells, an aspect easily to detect by SEM. At *P. verticilata* we can mention an abundance of pluricellular non-glandular trichomes which are offering the characteristical macroscopical aspect.

The unicellular non-glandular trichomes with pointed tip and thickened wall were noticed on the petiole of *P. clusiifolia* (fig.) and its variegated leaves sort. It was found, as well as, at the taxons of *P. clusiifolia, P. obtusifolia* and their variegated leaves sort (fig. **M**), on the lamina level and mainly on the midrib. This trichomes have the thickened walls and narrow lumina.

Conclusions

The aspects presented above bring new information about the trichomes types present at the members of *Piperaceae* family.

The mentioned anatomical data can be used as diagnosis characters in taxonomy.

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Explanation of the plates

Plate I. Glandular and non-glandular trichomes:

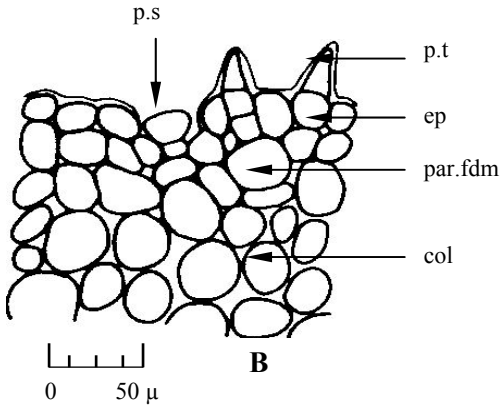
A - *Peperomia serpens*, stem, micromorphological surface view (SEM, x 390); **B** - *Peperomia clusiifolia*, leaf, detail of petiole; **C** - *Peperomia clusiifolia*, leaf, detail of mesophyll; **D** - *Peperomia serpens*, leaf, micromorphological surface view (SEM, x 360); **E** - *Peperomia clusiifolia*, leaf, micromorfological surface view (SEM, x 520); **F** - *Peperomia verticillata*, stem, detail of epidermis.

Plate II. Trichomes:

G - *Peperomia verticillata*, stem, micromorphological view (SEM, x 400); **H** - *Peperomia verticillata*, stem, detail of epidermis; **I** - *Peperomia verticillata*, leaf, detail of epidermis; **J** - *Peperomia orba 'Astrid'*, leaf, micromorphological view (SEM, x 350); **K** - *Peperomia serpens*, leaf, detail of low epidermis; **L** - *Peperomia serpens*, leaf, micromorfological surface view (SEM, x 700); **M** - *Peperomia obtusifolia* leaf, detail of upper epidermis

Abreviations

cel.ep - epidermal cells; **cel.st** - stomatal cells; **cut** - cuticle; **ep** - epidermis; **ep.s** - upper epidermis; **par.clz** - cellulosic parenchyma; **par.fdm** - fondamental parenchyma; **ţ.lc** - spongy parenchyma; **ţ.psd** - palisade parenchyma.



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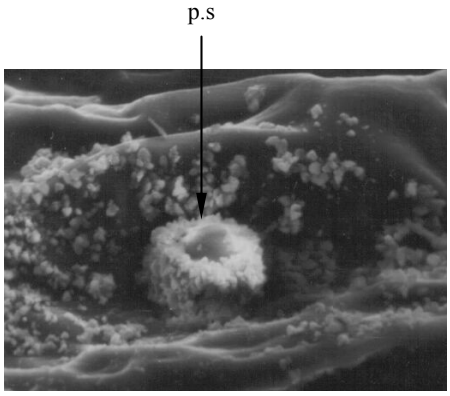

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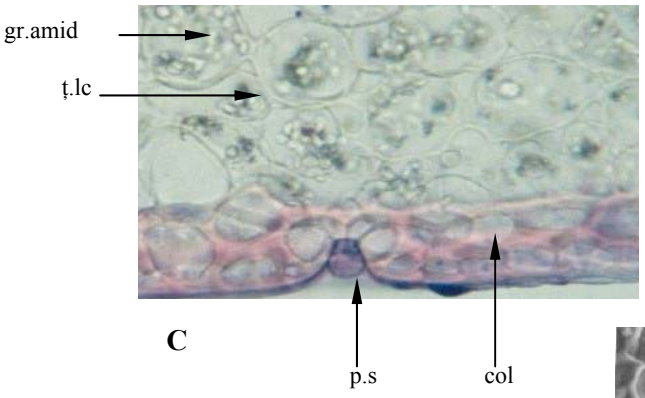

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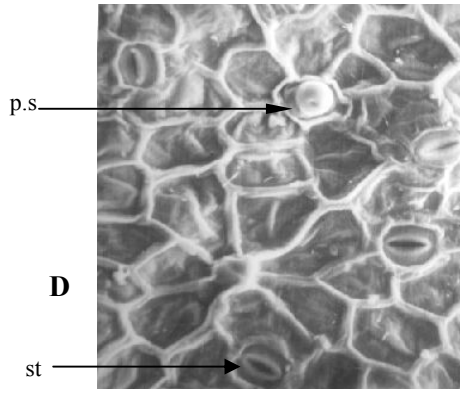

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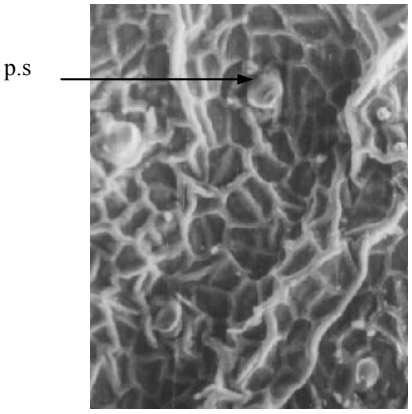

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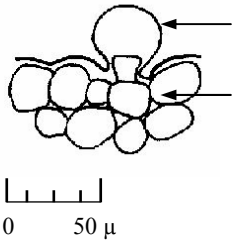

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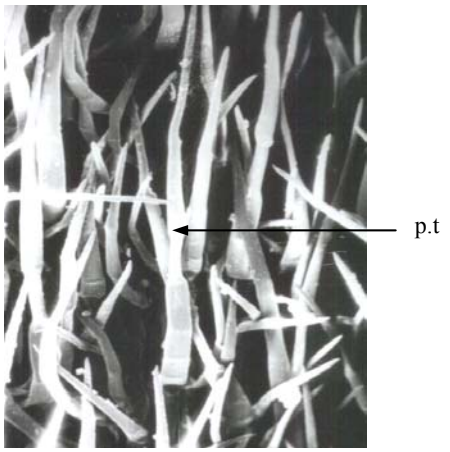

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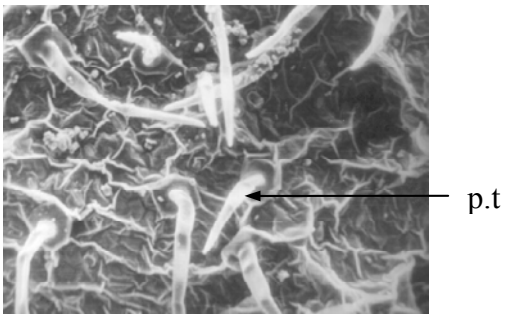

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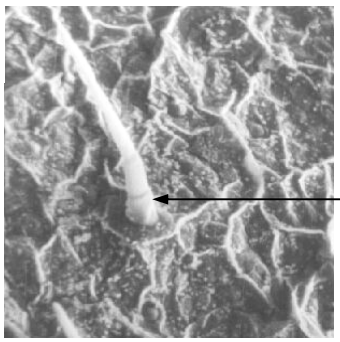

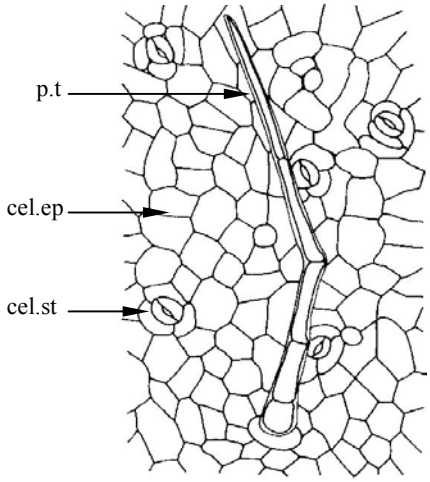

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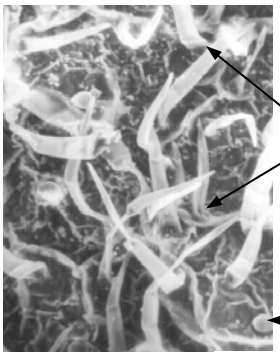

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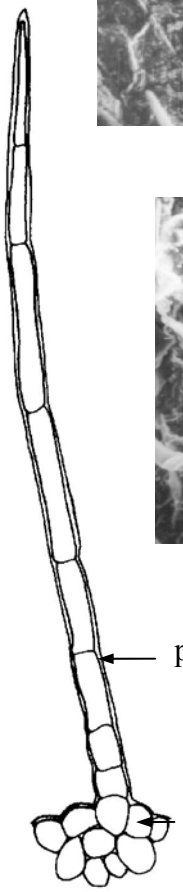

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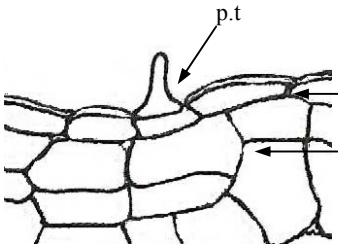

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