Nectaries have cuticle, epiderm, glandular tissue and parenchyma in all species. The xylem vessels have spiral secondary cell wall thickenings. The nectary cuticle of *E. amygdaloides* and *E. palustris* is thin, that of *E. cyparissias*, *E. esula*, *E. myrisnites* and *E. virgata* living at xeroterm area is thicker. Nectary of *E. palustris* has the highest epidermal cells and the largest number of cell rows of glandular tissue (6-7) which varied from 1 to 4 in the other plants. Cells of glandular tissue are isodiametric in all species except of *E. cyparissias*. Biggest cells of glandular tissue were detected in the nectary of *E. virgata*. The histological structure of the nectary was specific for the studied plant species.

P1129. Taxonomic studies of the two Nigerian varieties of Ricinus communis

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Ricinus L.(Euphorbiaceae)is a monotypic genus represented by R. communis in Nigeria. It comprises two distinct varieties which may grow either in gregarious or solitary formations. The distinguishing features of the species are colour of vein, petiole and stem which may be green or brown, number of fruit prickles as well as shape of midrib and types of stomata, pollen grains and crystals which may occur either as raphides or localized crystals of calcium oxalate in the epidermal cell lumen. Epidermal wall pattern is usually curved or undulate while cell shape varies from polygonal to irregular. Stomata number per millimetre square ranges from 5-8 on both surfaces and stomata types are anisocytic, anomocytic and paracytic. In the two varieties, polymerase chain reaction (PCR) amplications with random amplified polymorphic DNA (RAPD) primers indicated similarities and differences at 0.59 and 0.41 coefficient levels respectively. Ricinus communis has both commercial and medicinal uses.

P1130. Distribution patterns of *Croton* (Euphorbiaceae) in Brazil

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Croton L. is the second largest genus of Euphorbiaceae, with over 1200 species, mostly found in tropical regions. Its main centres of diversity are in the Neotropics, with c. 300 species recorded for Brazil. To identify distribution patterns of the genus in Brazil, we analysed c. 2130 herbaria collections from the total range of 33 species that occur in the State of São Paulo. Natural populations of many species were also visited in order to better understand their lifeforms, habitats and morphological variability. The few endemic species found are trees from the southeastern Atlantic rainforest, one of them restrict to a small area in São Paulo. The other species were classified as mesothermic or megathermic. The latter show preference for tropical areas: among them are those widespread in the neotropics, those found all over South America, and those from central or northeastern Brazil, with their southern limits in São Paulo. The group of mesothermic species includes exclusively grassland herbs, with almost all populations below the Tropic of Capricorn, and northern limit in São Paulo State. The bearing of these data on neotropical biogeography is stressed.

P1131. A taxonomic revision on the genus of Euphorbia (Euphorbiaceae) in Iran

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Euphorbiaceae is the fifth great family of flowering plants and *Euphorbia* is one of the largest genus of flowering plants that based on Flora Iranica consists of over 100 species in Iranica region and more than 60 species in different parts of Iran. In this work plants belong to this genus were studied and in this order to all of the herbarium materials preserved in a few herbaria collected from different parts of Iran and specimens in the feild were studied and determinated and the following results are presented:
- There are 65 species of *Euphorbia* in different parts of Iran.
- The species *E. rosularis* A.THEOD. and *E. maculata* L. are recorded for the first time from Iranica area and the flora of Iran. These species in the flora of USSR. have been formerly known as an endemic of Turkmenistan and caucasus respectively.
- The species *E. franchetii* B.FEDTSCH., *E. grossheimii* PROKH., *E. consanguinea* SCHRENK and
E. kopetdaghi PROKH. are reported for the first time for the Flora of Iran
- *E. cheirolepioides* RECH.f. is synonym with *E. grossheimii.*
-The species *E. aellenii* RECH.f. according to this study is synonym with *E. kopetdaghi* PROKH..

P1132. Character evolution of Alnus (Betulaceae) and fossil leaves and cones from the Tertiary of Northern Thailand

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Alnus Mill. (Betulaceae) today comprises approximately 35 species and is widespread in the temperate Northern Hemisphere, extending to Southeastern Asia and to the Andes. Tertiary macrofossils are widely distributed in North America, Europe, and Asia, usually as isolated leaves and infructescences. Recent leaves were surveyed to search for taxonomically important characters to allow placement of fossil leaves within subgenera or smaller subtaxa of *Alnus*. Semicraspedodromy was observed in some species of the subgenera *Alnus* and *Clethropsis*, but not in *Alnobetula*. Character evolution analysis using parsimony suggested that craspedodromy was plesiomorphic in the genus with independent evolution of semicraspedodromy in three subclades. Veins reaching the sinus before branching to the teeth is a derived character having evolved one or more times. Fossil leaves and seed cones were found in lacustrine deposits in early Miocene or late Oligocene basins in Northern Thailand. The venation pattern and teeth of the leaves are most similar to those of Recent *Alnus fernandi-coburgii* and *A. cremastogyne* (both subgenus *Alnus*) from China.

P1133. Cuticle micromorphology and anatomical structures of leaves of *Fagus* L.(Fagaceae) and its taxonomic implication

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The genus *Fagus* is distributed over the Eastern Asia, U.S.A. and Ukraine in the northern hemisphere. Many kinds of taxonomic system have been controversial. Cuticle micromorphology and anatomical structure of all 8 species of *Fagus* and outgroup were examined. 23 cuticle morphology have been described. The subsidiary cell shape, size of stomata, and so on, are considered important characters for the infrageneric classification. In the anatomical structure studies, 13 characters of anatomical features have been described. Shape of epidermal cells, papillae and shape of vascular bundle are considered important. A parsimony analysis of 26 characters resulted in a single most parsimonious tree with consistency indices of 0.73 and retention indices of 0.73 and tree lengths of 48 steps. The topology obtained from the analysis showed two major clade. The first clade was supported bootstrap value 80%, and the second clade bootstrap value 87%. Based on the cuticle morphology, the taxanomic system of Shen(1992) was generally supported except *F. longipetiolata*. .

P1134. Alders (*Alnus* Mill., Betulaceae) in the European Russia

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Alders (*Alnus* Mill.) are the common trees in Europe and Asia, and there are some taxonomically interesting forms on the border of the area. The examples of those forms are *A. kolaensis* Orlova (from Kola Peninsula and nearby North Karelia) and *A. barbata* C.A. Mey. (from Caucasus). Some researchers consider these forms as separate species, but others -- as subspecies of *A. incana* or *A. glutinosa* (respectively), or even as hybrids between these two species. We have checked mentioned hypotheses using multivariate methods based on classic morphometrics data and two variants of geometric morphometrics of alder leaf. We found that *A. "kolaensis"* is most probably the varieties or even the ecological form of *A. incana*. On the contrary, *A. barbata* must be considered as separate species. Our data show that the results of geometric morphometrics and classic morphometrics could be significantly different. The most productive way of placing the landmarks on the leaf is (in our case) to mark the end-points of the secondary veins.