STUDIES IN THE HELIANTHEAE (ASTERACEAE). XX.

NOTES AND NEW SPECIES IN *CLIBADIUM*.

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Clibadium is a genus of about forty species, including some which are common and widely distributed in the Neotropical Region. In spite of the absence of most of the US collections, which are on loan, it has been necessary to make preliminary studies toward the eventual treatments of the Heliantheae for the Floras of Ecuador and Peru. Recent Harling collections from Ecuador prove to include two previously undescribed species which are treated below. Comments are also provided on the following three species.

Clibadium caudatum Blake, is one of two species described from Panama which was inexplicably omitted from the recent treatment of that genus in Panama (Stuessy, 1975). Material of the species might key to *C. asperum* (Aubl.) DC. in that treatment, but could not be that species. The type of Blake's species was from an alluvial bottom near Bohío in the Canal Zone, and a recent collection (Nee 6963) from near Salamanca in the Province of Colon shows the characteristic broad leaf blades with caudate tips and appressed pubescence. The specimens apparently represent a distinctive element from low elevations in central Panama.

Clibadium eggersii Hieron., described from western Ecuador, seems to be the oldest name for at least the elements with appressed pubescence that have been treated under the names, *C. pittieri* Greenm., *C. polygynum* Blake and *C. propinquum* Blake (*Wulffia sodiroi* Hieron.). The species seems to range geographically from Costa Rica in Central America to areas of lower elevation on both sides of the Andes in Colombia and Ecuador. The species is particularly distinctive in the rather globose mature heads with a large number of ray florets (up to 40) in the axils of comparatively narrow bracts.

Clibadium sessile Blake was the second species described from Panama that was omitted from the recent treatment of the genus in that country (Stuessy, 1975). Descriptions and the locality in Chiriqui indicate that *C. subauriculatum* Stuessy is a synonym.

Clibadium manabiense H.Robinson, sp. nov. Plantae frutescentes 2.0-2.5 m altae mediocriter ramosae. Caules fulvescentes teretes leniter striati appresse scabriduli. Folia opposita,

petiolis 7-25 mm longis; laminae ovatae vel anguste ovatae plerumque 8-16 cm longae et 2.0-8.5 cm latae base cuneatae sensim breviter anguste acuminatae margine multo crenato-serrulatae apice late breviter acuminatae supra sparse appresse strigosae subtus dense scabro-pilosae inferne ascendentiter trinervatae. Inflorescentiae in ramis terminales corymboso-cymosae, ramis dense appresse strigosis, ramis ultimis 0-2 mm longis. Capitula 4-6 mm alta et 4-5 mm lata; squamae involucri steriles basilares 2 et squamae femineae exteriores ovatae apice distincte acuminatae ca. 4 mm longae et 2 mm latae margine breviter ciliatae extus breviter strigosae; paleae masculinae anguste oblongae vel anguste ellipticae ca. 3.5 mm longae et 0.7-1.0 mm latae margine et apice breviter ciliatae. Flores radii 9-13; corollae tubiformes 1.8-2.0 mm longae base leniter angustiores superne sparse puberulae et persparse setiferae, lobis 4 ca. 0.3-0.5 mm longis. Flores disci ca. 15; corollae 3.0-3.5 mm longae, tubis angustis ca. 1 mm longis extus glabris, faucis abrupte late campanulatis ca. 1.5 mm longis plerumque glabris, lobis 5 aequilateraliter triangularibus ca. 0.6 mm longis et latis intus ubique valde papillosis extus breviter laxe setiferis et sparse puberulis; thecae antherarum ca. 1.2 mm longae; appendices antherarum extus minute puberulae vel subglanduliferae. Achaenia radii biconvexa ca. 2mm longa et 1.5 mm lata superne laxe setifera, articulis apicalibus angustis ca. 0.5 mm longis valde contortis. Achaenia disci sterilia 2 mm longa inferne glabra apice dense pilifera. Grana pollinis 23-25 μm in diam. spinosa.

TYPE: ECUADOR: Manabí: Road Sto Domingo - Chone, Flavio Alfaro, alt. ca 100 m.s.m. On the roadside. Shrub, ca. 2 - 2.5 m high. Flower-heads dirty white. Anthers dark brown-violet. 11 V 1968. G.Harling, G.Storm & B.Strŏm 9410 (Holotype GB: Isotype US).

Clibadium manabiense seems most distinct in the markedly acuminate tips of the bracts in the head. The heads having 9-13 female flowers and 15 male flowers, and the presence of paleae in the disk are also notable. The number of flowers in the head are reminiscent of the species group containing C. grandifolium Blake and C. pacificum Cuatr. occurring at lower elevations from Costa Rica to western Colombia, but the latter two have much larger leaf blades with broadly rounded to subtruncate bases, more appressed hairs on the leaf undersurface, and mostly non-paleaceous male flowers. The setae of the disk corolla lobes and the upper surfaces of the ray achenes seem less rigid and less strict in C. manabiense than in such species as C. surinamense L.

As delimited by reddish resin, there are five resin ducts in the throats of both the ray and disk corollas. The ducts of the disk corollas are particularly prominent and extend into the basal halves of the lobes.

Clibadium harlingii H.Robinson, sp. nov.

Plantae frutescentes ad 3 m altae mediocriter ramosae. Caules pallide fulvescentes teretes striati dense scabriduli. Folia opposita, petiolis 6-10 mm longis; laminae oblongae vel oblongo-ovatae plerumque 7-13 cm longae et 2.5-5.0 cm latae base breviter acutae vel obtusae non decurrentes margine multo serrulatae apice breviter acuminatae supra dense appresse scabridae subtus erecto-patentiter scabro-pilosae, nervis secundariis pinnatis utrinque ca. 6 valde ascendentibus. Inflorescentiae terminales in ramis tripartitis dense glomeratae, ramis dense antrorse longe strigosis, glomerulis ca. 10-12-capitatis. Capitula ca. 4 mm alta et 3-4 mm lata; squamae involucri steriles basilares 3 latae ovatae 4-5 mm longae et ca. 2.5-3.0 mm latae apice acutae extus breviter strigosae; squamae femineae ovatae vel oblongae apice acutae vel breviter acuminatae 3-4 mm longae margine breviter ciliatae extus superne breviter strigosae; paleae masculinae subscariosae ovatae vel rhomboideae ca. 3 mm longae et 1.5 mm latae acutae margine breviter ciliatae. Flores radii 5-8; corollae tubiformes 1.5-1.8 mm longae base leniter angustiores plerumque glabrae superne persparse puberulae, lobis plerumque 2 ca. 0.5 mm longis. Flores disci 5-9; corollae ca. 3 mm longae cylindraceae extus superne sparse puberulae et in lobis dense breviter strigosae, tubis ca. 0.7 mm longis, faucis ca. 1.5 mm longis, lobis 5 oblongo-ovatae plerumque 0.6 mm longis et 0.4 mm latis intus superne et fere ad marginem papillosis; thecae antherarum ca. 1.2 mm longae; appendices antherarum glabrae. Achaenia radii subtrigona 2.0-2.5 mm longa et ca. 1.5 mm lata glabra, callis apicalibus prominentibus ad 0.5 mm altis et 0.7 mm latis. Achaenia disci sterilia ad 2.2 mm longa ubique pilifera, pilis superioribus densioribus. Grana pollinis 25-27 um in diam. spinosa.

TYPE: ECUADOR: Carchi: Road Tulcán - Maldonado, ca. 13 km south east of Maldonado, mountain rain forest, alt. ca 2600 m.s.m. Shrub, ca 3 m high. 1 III 1974. G.Harling & L.Andersson 12363 (Holotype GB: Isotype US).

Clibadium harlingii is thoroughly distinct in the glomerate form of the inflorescence, the pinnate venation of the leaves, and the glabrous ray achenes, but the species has a number of other peculiarities as well. The ray achenes of Clibadium seem to always have an apical projection of some type, though it is often small and contorted or easily deciduous. In C. pediculatum Aristeg. of Venezuela it is long and narrow and is persistent at maturity. The new species seems unique in the thickened broad form of the apical projection or callus, and a smaller but distinct callus is present on the sterile disk achenes. The disk corolla lobes of the new species have small but distinct papillae on the inner surface toward the tips and margins, a notable contrast with some species such as C. manabiense where the lobes are evenly papillose on the whole inner surface.

The resin ducts of C. harlingii, as indicated by reddish

resin, are restricted to the five veins in the throat of the disk corolla.

The above new species were obtained in a collection of Ecuadorian Heliantheae recently obtained from Dr. G. Harling at Göteborg. The genus Clibadium was particularly well-represented, as indicated by the following records. The numbers cited under 5000 are by Holguer Lugo S., those above 5000 are from the Harling series: Clibadium eggersii Hieron., Pastaza 2481, Napo 3094; C. laxum Blake, from the lowlands of Bolivar, El Oro and Pichincha to the west of the Andes, 9311, 9680, 11525, 14347; C. mexiae Blake, from Pastaza and Tungurahua on the eastern side of the Andes, 4605, 10153; C. microcephalum Blake, from Pastaza, 4554, 10114; C. sprucei Blake, from Chimborazo in central Ecuador, 763; C. surinamense L., material with shorter leaves tips from Bolivar and El Oro on the western side of the Andes, 9670, 14194, 14335, material with narrowly acuminate leaf tips from Morona-Santiago, Napo and Pastaza on the eastern side of the Andes, 152, 224, 228, 1027, 1338, 1343, 1360, 1371, 1385, 1396, 1414, 1426, 1703, 2315, 2821, 2926, 3890, 3986, 4369, 4941, 4971, 6948, 11876, 11959, 12679, 13823; C. sylvestre (Aubl.) Baill., from Napo, 2052, 2129, 7031.

Four specimens of Ecuadorian Clibadium have also been obtained from the Marie Selby Botanical Gardens which I had previously failed to identify correctly: Clibadium cordatum Cuatr., from Carchi near the Colombian border, Madison et al. 4940; C. laxum Blake, from Pichincha, Dodson et al. 7589, 7691; C. surinamense L., from Los Rios, Dodson et al. 7037. Some earlier Ecuadorian collections of C. laxum have been seen in herbaria under the name C. terebinthaceum (Sw.) DC.

Literature Cited

Stuessy, T. F. 1975. Melampodiinae. in R. E. Woodson, R. W. Schery, et al., Flora of Panama. Part IX. Family 184. Compositae. Ann Missouri Bot. Gard. 62: 1062-1091 (1976).

Clibadium manabiense H. Robinson, Holotype, University of Göteborg. Photos by Victor E. Krantz, Staff Photographer, National Museum of Natural History.

Clibadium harlingii H.Robinson, Holotype, University of Göteborg.

Clibadium, enlargements of heads: Top. C. manabiense. Bottom. C. harlingii.