A NOTE ON ASTER AGERATOIDES AND OBSERVATIONS ON ASTER IN THE PHILIPPINE ISLANDS

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The purposes of the present paper are two. Firstly, to amend formally the use of the name *Aster trinervius* which I made in my revision of Himalayan Asters (Grierson, 1964, p. 98). Secondly, to set down the results of an examination, requested by Professor van Steenis, of the Asters of the Philippine Islands which are closely related to *A. ageratoides*.

Wagenitz (1964) discovered that the description of the European *A. trinervis* Nees dates from 1818, eleven years earlier than Desfontaine's which is cited in Index Kewensis. This also antedates Don's description of the Indian *A. trinervius* (1825) which, although differing by one letter from the European, is etymologically the same epithet and could lead to confusion. Consequently, the use of this name for the Asiatic plant must be abandoned and one must revert to the name *A. ageratoides* Turcz. (Bull. Soc. Nat. Mosc. 7: 154, 1837), which Handel-Mazzetti employed (1938).

The subspecific taxa of this species as recognized in my previous paper now become:

A. ageratoides Turcz.

subsp. *ageratoides* (Syn.: *Aster trinervius* Don subsp. *ageratoides* (Turcz.) Grierson l.c. p. 102)

subsp. *trinervius* Grierson nom. nov. (Syn.: *Aster trinervius* Don nom. illegit. non *A. trinervis* Nees. See Grierson l.c. p. 100)

var. *trinervius* (Syn.: *Aster trinervius* subsp. *trinervius* var. *trinervius* Grierson l.c. p. 101)

var. *wattii* (C. B. Cl.) Grierson (Syn.: *Aster trinervius* subsp. *trinervius* var. *wattii* (C. B. Cl.) Grierson l.c. p. 101).

Since *A. ageratoides* is by far the most widespread of this group of species one must first enquire whether the Philippine Asters are distinct from it. Although the latter are closely related, the answer is definitely affirmative for the following reasons. Their leaves are pinnately veined and lack the prominent pair of lateral veins which render the leaves of *A. ageratoides* so distinctive. Additionally, the ovate-lanceolate leaves of the plants described as typical *A. philippinensis* are also characteristic in becoming blackish on drying. These characters taken together are to be found only in one population of *A. ageratoides* from the Khasia Hills, but this is otherwise differentiated by having lax sparse inflorescences of small capitula. The inflorescences of the Philippine plants are characterised by the presence of bracts that are miniature versions of the foliage leaves in contrast to the inconspicuous narrow linear bracts of *A. ageratoides*. In the capitulum of typical specimens of *A. ageratoides* there are generally fewer phyllaries, about 8 being phyllaries visible on one side of a flattened dried flower head (occasionally in some southern Chinese populations there may be twice as many visible). In Philippine specimens 15–20 phyllaries are regularly visible on each side of the capitulum.

The ligules of the island species are shorter (5–6 mm long) than those of *A. ageratoides*, generally 8–10 mm long.

What other species of the *ageratoides* alliance could be confused with the Philippine Asters? The leaves of *A. baccharoides* Steetz are lanceolate and lack obvious trinervation but this species is distinct both from the latter and from *A. ageratoides* itself by reason of its habit and involucre. Its capitula are borne singly or in groups of a few on short axillary branches among the upper leaves, and does not develop the corymbose or paniculate form of inflorescence. The involucre is 4–5-seriate (in contrast to the 3–4-seriate condition of the other species) with 20–21 phyllaries visible on each side in a herbarium specimen extending down on to the peduncles making them appear scaly.

In the Philippines, the genus *Aster* is confined to the mountainous island of Luzon and two species have been recognized: *A. philippinensis* S. Moore (1905) and *A. luzonensis* Elm. (1906). The account of the latter species contains the following key:-

"Stems and branches sparsely leafy, leaves 2–3 cm long 1–2 cm wide . . . . . *A. philippinensis*
Stems and branches very leafy, leaves larger. *A. luzonensis.*"

These differential features, in part true, are nevertheless misleading.

The type specimens of both of these are imperfect: that of *A. philippinensis* consists, as many specimens do because these Luzon Asters may become straggling subshrubs up to 4 metres tall, of two inflorescence branches plucked from a large specimen. Of *A. luzonensis*, only an isotype is available, the holotype having been destroyed with the Manila Herbarium during World War II. This isotype consists of two specimens one of which matches the type of *A. philippinensis*, the other is obviously the one to which Elmer was referring.

In comparing such typical material as does exist and the specimens that obviously match such material, the following salient points of difference between *Aster philippinensis* and *A. luzonensis* emerge:

Habit: *A. luzonensis* is rarely over half a metre tall (45–55 cm high, although *Sulit* (PNH 7661) has stated that it may grow to 1 metre). Its stems branch from near the base whereas those of *A. philippinensis*, where the size of the plant has been declared in the field-note, may be 0·75–1·5 (up to 4 metres tall) and bear widely branched inflorescences above.

Leaves: Those of *A. philippinensis* are lanceolate or ovate-lanceolate with rounded bases (the lower leaves of some small specimens tend to be cuneate based), margin 3–13 toothed on each side, teeth ending in fine points. Upper surfaces are subglabrous or covered with fine, pale-coloured, more or less appressed hairs which give a slight roughness to the touch. The colour of the upper surface in the dried condition is dark brown. They measure up to 10 cm long and 2·5 cm broad.

The leaves of *A. luzonensis* are oblanceolate with cuneate bases, margins 4–10 toothed, teeth coarse and blunter than in *A. philippinensis*. Their upper surfaces are covered with short stiff hairs which arise from enlarged basal cells giving them a distinct harshness to the touch. In size the leaves range from 3·5 × 1·5 cm to 7 × 2·5 cm and in the dried state their upper surfaces are greenish-brown.

Inflorescence: In both it is paniculate but in *A. philippinensis* the lower axillary racemes or solitary capitula are borne on long branches which, in large plants, measure 20–30 cm long. The branches of *A. luzonensis* are only about 5 cm long and on them only the upper capitula develop to maturity the lower ones are obviously abortive. This gives rise to short corymbose form in contrast to the loosely branched inflorescence of *A. philippinensis* in which every capitulum appears to be functional. Each bifurcation is accompanied by a bract which is generally a miniature edition of the foliage leaves. Possibly this is the basis of Elmer's remark that the stems and branches of *A. luzonensis* were "very leafy".

Capitula: Those of both *A. philippinensis* and *A. luzonensis* contain 13 or 14 female flowers and about 7 hermaphrodite flowers. The ligules of the ray flowers are short as compared with those of *A. ageratoides*, 5–6 mm long (as compared with 9 mm for the latter). There is little difference in the measurement of the hermaphrodite flowers: in all three species they are about 6 mm long and more or less equally divided into tube, bell and lobes.

Most of the specimens examined, as the following citations show, fall into these two groups, the majority of them matching *A. philippinensis*. There are, however, a number of intermediate or doubtful specimens which I shall discuss following the citations.

The following key summarises these comparisons:

1. Tall growing herbs (or subshrubs) 0·75–4 m tall. Leaves lanceolate or ovate lanceolate, rounded at the base, upper surface slightly rough pubescent, becoming blackish on drying. Inflorescence widely and loosely branched, capitula apparently all functional *A. philippinensis*

\+ Low growing herbs under 0·5 m tall. Leaves oblanceolate, cuneate at the base, hispid on the upper surface, remaining green on drying. Inflorescence shortly corymbose, lower capitula on each branch shrivelled, abortive . . . . . *A. luzonensis*

Several specimens bear no collector's number but have been given a serial number in accordance with some collecting scheme. For the sake of distinction these numbers have been quoted and their sources have been abbreviated as follows: BS = Bureau of Science, FB = Forestry Bureau; PNH = Philippine National Herbarium.

It must also be noticed that the present day Mountain Province of Luzon comprises (from South to North) the subprovinces of Benguet, Ifugao, Bontoc and Kalinga. Lepanto Province, which is referred to on several specimens, appears to have combined the eastern part of the coastal Ilocos sur Province and the western part of Bontoc subprovince, but is now no longer recognized.

The author is indebted to the Directors and Curators of the herbaria quoted among the citations for the facilities they made available for loan of material and, in some cases, for study at their institutes.

A. philippinensis S. Moore: Highlands of Lepanto, 1525–2135 m, 1896, *John Whitehead* (BM); without locality or date, *Micholitz* (K); Benguet, *Loher* 3607 (MU); Benguet, Mt. Santo Tomas, 1 vii 1904, *R. S. Williams* 1105 (NY);

Benguet, Suyoc to Panai, x–xi 1905, *Merrill* 4726 (NY); Benguet, Mt. Tonglon, x–xi 1905, *Merrill* 4825 (L); District of Lepanto, x–xi 1906, *Kelemine* (?) FB 5687 (NY); Benguet, Baguio, iii 1907, *Elmer* 8405 (L); Benguet, Mt. Tonglon (Mt. Santo Tomas), xii 1908, *Ramos* BS 5417 (L); Benguet, v 1911, *Merrill* 836 (MU); Ifugao, Mt. Polis, ii 1913, *McGregor* BS 19832 (K, L); Bontoc, 26 ii 1914, *Vanoverbergh* 58 (A, L); Lepanto, 23 ii 1916, Collector unknown, Revision Plantas Vascul. Filipinas 1512 (L); Benguet, Pauai, iv–vi 1918, *Santos* BS 32024 (A); Bontoc, iii 1920, *Ramos & Edano* BS 38113 (L); Benguet, Mt. Santo Tomas, ii 1925 *Ramos & Edano* BS 45125 (NY); Benguet, Mt. Data, 5 v 1932, *Quisumbing* BS 84661 (NY); Mountain Prov., Mt. Nangaoto, 2300 m, in mossy hardwood forest, 11 ii 1948, *Sulit* PNH 7697 (A, PNH); Ifagao, Mt. Polis, 2042 m, in partly open forest, 19 v 1948, *Celestino* sn (A); Mountain Prov., Mt. Santo Tomas, 2240 m, on forest slope climbing on bushes and trees, 3 xii 1953, *van Steenis* 18565 (L); *Mendoza* PNH 20405 (PNH, L); Mt. Santo Tomas, 24 xii 1958, *Steiner* 1601 (PNH), 1601A (PNH); Mountain Prov., Sumigar, Banaue, 1675 m, 30 viii 1961, *Conklin & del Rosario* 197 (L, PNH).

The following are typical of **A. luzonensis** Elmer:

Benguet, Mt. Santo Tomas, v 1904, *Elmer* 6251 (NY—isotype. This is a mixed gathering: the right hand specimen answers the description of *A. luzonensis*, the other is *A. philippinensis*); Benguet, Kabay, x–xi 1905, *Merrill* 4439 (L); Benguet, Baguio, iii 1907, *Elmer* 8405 (K); Benguet, xii 1908, *Ramos* BS 5734 (L); Benguet Mt. Pulog, i 1909, *Curran, Merritt & Zschokke* FB 16122 (L); Benguet, Pauai, iv–vi 1918, *Santos* BS 32074 (NY); Benguet, xii 1925, *Clemens* 16439 (NY); Benguet, Mt. Singacalsa, 2300 m, 29 i 1948, *Sulit & Celestino* 2274 (PNH), 7661 (A, PNH).

Two specimens examined are in varying degree doubtful and are possibly intermediate between the two species.

Merrill 11714 (K)—Benguet, Mt. Santo Tomas, xii 192 (?). Upper part of stem. Leaves elliptic lanceolate, blackish, rough above. Lower peduncles 6 cm long, abortive capitula present.

Ramos & Adano BS 40493 (K)—Benguet, Mancayan to Baguio, x 1921. Leaves as in last. Inflorescences immature in short axillary groups of about five capitula, some apparently abortive.

There are thus two apparently distinct taxa and a few doubtful (intermediate) specimens. How are they to be interpreted? Do they represent distinct although closely related species, the intermediates being hybrids between them? Or are they ecological variants of one and the same species which are separated by barriers that occasionally break down? There is, in my submission, no evidence at present that points in one direction or the other although it must be remarked that as variants of the same species they have comparatively more stability than do the various forms of *A. ageratoides*.

These species should be maintained in the herbarium until such time as field observation has confirmed or denied that *A. luzonensis* always grows in one (dry, rocky) habitat and *A. philippinensis* in another (shrubby or wooded and more moist). If intermediates do in fact occur are they to be found in

habitats between these two? Living material if it can be maintained in cultivation would also go a considerable distance in supplying cytological and genetical answers to this question.

References

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