AN INSTANCE OF EAST–WEST CONFUSION IN CHINESE UMBELLIFERAE, OR *ARRACACIA* OUT OF ASIA!

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Franchet (1894) described two species from Yunnan as *Arracacha* (=*Arracacia*) *delavayi* and *A. peucedanifolia*, respectively, in a genus hitherto known only from Mexico to Bolivia in the New World. Wolff (1925) made *A. delavayi* the type of his new genus *Physospermopsis*, but neither de Boissieu (1906), Wolff, nor Norman could find an appropriate generic home for *A. peucedanifolia*. In 1980, Sheh and Shan established the new genus *Cyclorhiza* with one species and a second taxon which became *C. major* (M.L. Sheh & R.H. Shan) M.L. Sheh in *Flora Reipublicae Popularis Sinicae*. This work does not mention either *A. peucedanifolia* or *Cenolophium chinense* M. Hiroe (1958), which was based on similar material. The correct name for *A. peucedanifolia* is *Cyclorhiza peucedanifolia* (Franch.) Constance, *comb. nov.* and the genus *Arracacia* is to be excluded from Asia.

Keywords. Apiaceae, *Cenolophium, Cyclorhiza.*

INTRODUCTION

Adrien René Franchet (1836–1900), Director of the Muséum National d'Histoire Naturelle de Paris and one of the principal 19th century French students of Far Eastern floras, took as his special interest the discoveries of the four missionary plant collectors, Armand David, Jean Marie Delavay, Paul Guillaume Farges, and Jean André Soulié. According to Coats (1970), 'Delavay sent him some 200,000 beautifully prepared specimens, representing more than 4000 species, about 1500 of them new . . .'. Franchet was still engaged with Delavay's collections at the time of his own death.

In a paper dealing with Delavay's Yunnan collections, Franchet described *Arracacha delavayi* and *Arracacha peucedanifolia*, with the comment that, 'Il est intéressant de trouver en Asia des représentants de genre *Arracacha* [=*Arracacia* Bancr.], signalé jusqu'ici seulment dans le Mexique et dans l'Amérique du Sud' (1894). Henri de Boissieu, in a brief comment on the phytogeography of Chinese Umbels, noted this anomaly and added that in China these *Arracacia* species are neighbours of, among others, 'des *Trachydium* et des *Vicatia*, genres indiens et chinois' (1906).

Receipt of a copius collection of Chinese and Japanese plants from Uppsala inspired Hermann Wolff (1925) to propose four new genera; two, *Chamaesium* and *Tongoloa*, were based on Tibetan collections of Soulié, and one, *Sinodielsia*, from

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material obtained in Yunnan by Julien Cavalerie. The fourth genus, *Physospermopsis*, also originated from Cavalerie's collection, but was discovered to match in detail Franchet's original characterization of *A. delavayi*, which was then designated the generic type. Wolff expressed scepticism of the occurrence of the genus *Arracacia* in China but was unable to say whether or not *A. peucedanifolia*, Franchet's second species, really belonged to that genus. On a paratype of the latter at P, Wolff indicated transfer of this taxon to *Physospermopsis*, but apparently never confirmed it in print. *A. peucedanifolia* differs from *Physospermopsis* by its much more dissected leaves, prominent involucre and involucel, conspicuous calyx teeth, solitary vittae, and deeply sulcate seed face.

Part III of Wolff's '*Umbelliferae* Asiaticae novae relictae' (1930) contains a description of *Ligusticum waltonii* (C.B. Clarke) H. Wolff or Fedde based on a collection at Kew labelled '*Seseli waltonii* C.B. Clarke' obtained by Walton of the Tibet Frontier Commission, together with a second specimen secured by Norton of the 1922 Everest Expedition.

Working from notes taken during the academic year 1955–56, which he spent in Berkeley, Minosuke Hiroe in 1958 described *Cenolophium chinense* on the basis of a UC sheet of the collection *George Forrest* 11,081 from the Yung-pe mountains of Yunnan. This sheet had been received from Edinburgh, probably in the 1920s, under the name '*Bupleurum*'. The 'master sheet' of *Forrest* 11,081 (E) proves to be a virtual Rosetta Stone. Attached to the specimen is the following note: 'Fr. juvenilis pyriformis a latere compressus. Mericarpia transverse secta eximie pentagona. Juga aequaliter evoluta, breviter alata; vittae vallecular singulae, com. 2; samen forma mericarpii, ad ferrem complanatum'. This note, handwritten and unsigned, is presumably attributed to Wolff. A second handwritten note is in English: 'Probably an undescribed genus. We have a fine specimen at BM under this No., but it is only in flower, so does not help. I judge from his note that Wolff thought it new. C.N. [Cecil Norman]'. Finally, an unsigned note, probably written in pencil at the bottom of the sheet, designates the plant as '(*Bupleurum*! Folia composita!)'.

At Nanjing in 1980, Meng-lan Sheh and Ren-hua Shan employed *Ligusticum waltonii* as the type of their new genus *Cyclorhiza*. In addition, they described a var. *major* based on *R.C. Ching* 24,750 from Dengchuan, Yunnan and several paratypes from either Tibet, Yunnan, or Sichuan. They assigned *Cyclorhiza* to Tribe Smyrnieae, noted its resemblance to the genus *Seseli* in aspect, but defined it as: 'Genus novum proximum *Vicatiae* DC., sed floribus flavis, pollinibus subrhombiformibus, vallecularis singulari; commissuralis 2 recedit'. In *Flora Reipublicae Popularis Sinicae* (1992: 236), Sheh proposed the new combination *Cyclorhiza major* (M.L. Sheh & R.H. Shan) M.L. Sheh, which was now illustrated for the first time. The Flora makes no mention of either *Arracacia peucedanifolia* Franch. or *Cenolophium chinense* M. Hiroe.

Through the generous and persistent efforts of Porter Lowry II (MO), the specimens of the supposed Chinese Arracacias were located at P and then courteously loaned to me by the Paris authorities. It was immediately apparent that *Forrest*

11,081, the type of *Cenolophium chinense* M. Hiroe, is an excellent match for authentic material of *A. peucedanifolia* Franch. At the same time it was equally clear that none of these specimens represent either *Cenolophium* or *Bupleurum* — a *Bupleurum* with compound leaves constituting a kind of botanical oxymoron! When a perusal of the excellent line drawings in the *Flora Reipublicae Popularis Sinicae* failed to yield a convincing match, I fell back on the strategy of circulating photocopied versions of the Forrest and Ching collections among those working on Chinese Umbelliferae.

A quick reply from Mark F. Watson (E) not only solved the problems of identity but pointed to the illustration I had carelessly overlooked in *Flora Reipublicae Popularis Sinicae*. Professor Sheh had earlier kindly lent me specimens of several genera she and Prof. Shan had described, including a specimen of *Cyclorhiza waltonii*, which I knew did not match my plants, particularly because of its finely dissected foliage. What I did not notice was that the var. *major* described but not illustrated in the same place was now depicted in the *Flora Reipublicae Popularis Sinicae* as Figure 105, just over the page from Figure 104 of *C. waltonii* proper. I fully agree with Prof. Sheh that var. *major* represents a taxon specifically distinct from *C. waltonii*. These accumulated observations, in my opinion, necessitate a change in name and warrant an emended description.

Cyclorhiza peucedanifolia (Franch.) Constance, **comb. nov. Fig. 1.**
Syn.: *Arracacia peucedanifolia* Franch. in Bull. Soc. Philom. Paris VIII. 6: 114 (1894); *Cenolophium chinense* M. Hiroe, Umbell. Asia 1: 141 (1958); *Cyclorhiza waltonii* (H. Wolff) M.L. Sheh & R.H. Shan var. *major* M.L. Sheh & R.H. Shan in Acta Phytotax. Sinica 18(1): 46 (1980); *C. major* (M.L. Sheh & R.H. Shan) M.L. Sheh in Flora Reipublicae Popularis Sinicae 55(3): 236, fig. 105 (1992).

Plants stout, perennial, caulescent, scabrous or scaberulous throughout, 0.8–1.2m tall from 1 to several large dauciform roots up to 15cm long and 1.5cm diam., the stem angled, manifestly ribbed, branching above and with sparse fibrous leaf remains at base. *Leaves* ovate-triangular, ternate-bipinnate, 12–20cm diam., the first divisions long-petiolulate, the subsequent ones shorter-petiolulate to sessile, the leaflets lanceolate to linear-lanceolate, 2.5–6cm long, 3–10mm broad, sharply acute, the entire margins and veins beneath minutely white-scaberulous; *petioles* rather stout, 3–10cm long, petioles, petiolules, and rachises strongly ribbed, the basal sheath short, ovate, moderately dilated, 2–2.5cm long; lower cauline leaves like the basal, the uppermost reduced to inconspicuous bladeless sheaths. *Inflorescence* of compound umbels terminal on the main stem and lateral upper branches, the peduncles 5–18cm long; umbels 3–8cm diam., the rays 6–15, slender, unequal, to 6cm long, spreading-ascending, both rays and pedicels slightly webbed; involucre and involucel lacking, or consisting of a few inconspicuous bracts 2–5mm long; umbellets 5–15-flowered, the mature pedicels unequal, 5–11mm long, spreading-ascending; *flowers* regular, calyx teeth minute or lacking, the petals greenish-yellow, oval to obovate with a

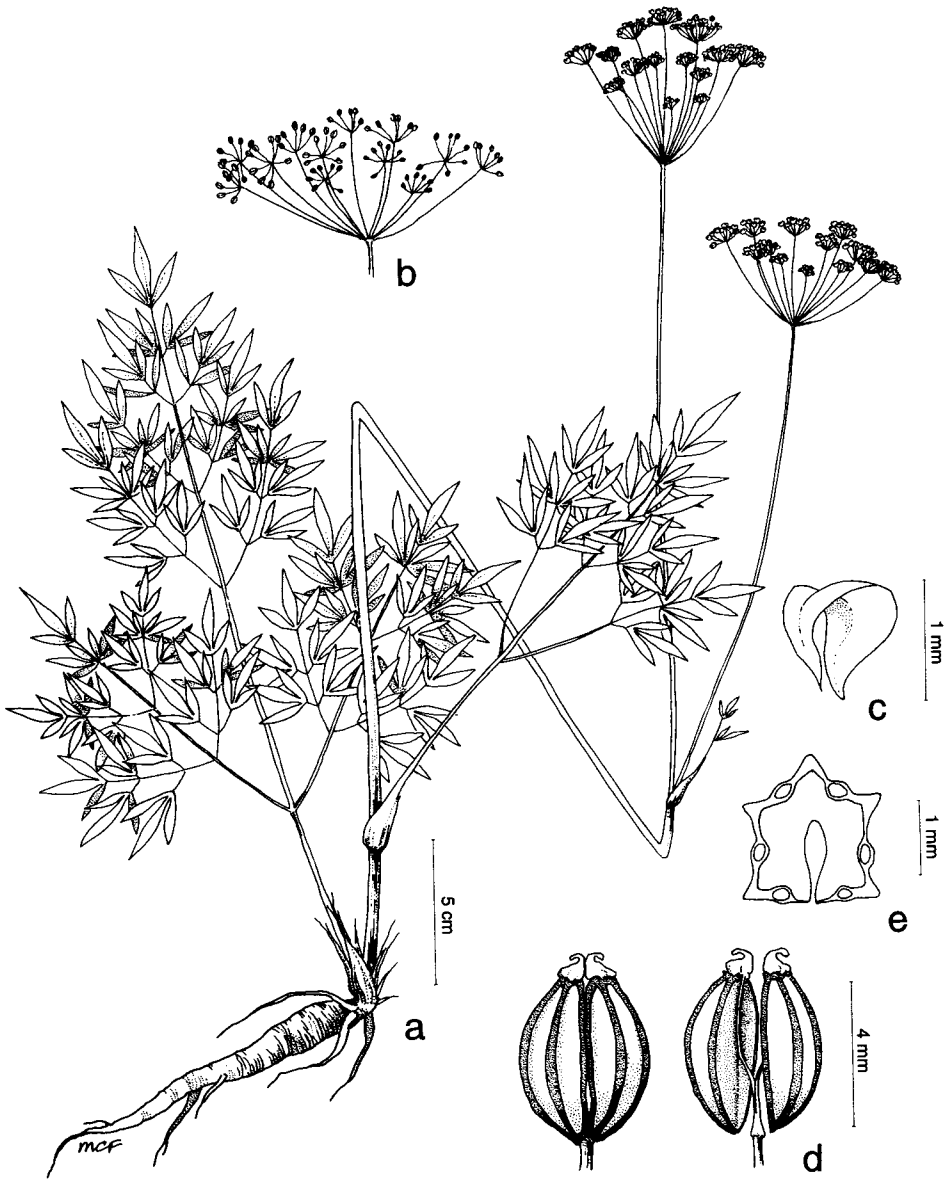

FIG. 1. *Cyclorhiza peucedanifolia*. a, habit; b, post-flowering umbel; c, petal; d, fruit, external view and showing carpophore; e, fruit transection. (a, from lectotype & *Delavay* 4586; b, from *Forrest* 11,081; c, from *Delavay* 4586; d & e, from lectotype.)

narrowly inflexed apex nearly as long as the blade; stylopodium massive, low-conical, the disc crenulate, the styles shorter than the stylopodium, recurved; carpophore divided to a little below the middle, the halves adnate to the mericarps; *fruit* oblong-oval, 4–7mm long, 2.5–3mm broad, slightly compressed laterally, the mericarps

pentagonal, the ribs acute but unwinged, subequal; vittae prominent, solitary in intervals, 2 on commissure; *seed face* deeply sulcate; *chromosome number* unknown.

Type: China, Yunnan: in fissures in calcareous rock, Mount Pee-cha-ho, near Mo-so-yn, 31 viii 1884, *Delavay* 946 (lecto. P).

Additional specimens examined. CHEKIANG. Shion-tou village, Leu-yan, 7 viii 1924, *R.C. Ching* 2337 (UC); Yen-tang-shan, Wen-chou-fu, 3000–5000m, 14 viii 1924, *C.Y. Chiao* 1485 (NAS 14,684, UC).

YUNNAN. In prairies of Houng-Li-pin, above Tepin-tze, 16 viii 1888, *Delavay* 4586 (P); rocks, calcareous hills of Ki-Mis je, near Kiang-yn, 14 ix 1884, *Delavay* s.n. (P); Nieou-Ko-chan, near Pin-tchouan, ix 1906, *Ducloux* 4649 (P); Yung-pe mountains, *Forrest* 11,081 (BM, E, UC); open stony pasture on the margins of pine forests, mountains of the Chungtien plateau, 11,000ft, vii 1914, *Forrest* 12,668 (E), 13,000ft, 12,816 (E).

To distinguish clearly *Cyclorhiza* from American *Arracacia* is not as easy as it sounds, partly because the latter is a complex genus that seems to defy sharp characterization. The possession by *Cyclorhiza* of one to several swollen dauciform taproots is certainly reminiscent of the underground structure of some Arracacias, particularly of *A. xanthorrhiza* Bancr., the traditional root crop of the Incas. The strongly ribbed stems, rays, and pedicels, the scabrosity of the whole plant, including leaf veins and margins, the uniformly entire leaflet margins, the rudimentary or completely lacking involucre, involucel, and calyx, the low stylopodium with shorter styles, the oblong-oval, slightly laterally compressed fruit with unwinged ribs, the solitary oil tubes, and the sulcate fruit are some of the most distinctive characters or character-states of *C. peucedanifolia.* Many of these can be matched individually with one or another of the approximately 30 species of *Arracacia,* but most of the other characters are discrepant. Although there are comparable problems dealing with the definition and interrelationships of the Chinese genera believed to be associated with *Cyclorhiza,* viz. *Vicatia* DC., this is a much more appropriate place for *C. peucedanifolia,* and it has the great virtue of eliminating the genus *Arracacia* from Asia and confining it to the New World.

Footnote

As a footnote, two other *Arracacia* epithets were introduced in Franchet's original publication; while doubtless neither is valid, both are in the literature and it is annoying to have them unidentified. Franchet contrasted the fruit of *A. peucedanifolia* with that of '*A. biternata* (*Sium biternatum* Dombey)'; the fruit of *A. delavayi* is compared with that of *A. acuminata* Benth., the involucre and involucel with that of *A. glaucescens* Benth., and the leaf texture with that of '*A dubia* (*Ligusticum dubium*) Humb. et Bompl. [sic]'. *Arracacia acuminata* Benth. = *Neonelsonia acuminata* (Benth.) J. Coult. & Rose, and *A. glaucescens* = *Myrrhidendron glaucescens* (Benth.) J. Coult. & Rose. But what about *A. biternata* and *A. dubia*? From examination of material in P, where Franchet worked, it appears that *A. biternata* is a herbarium name bestowed on a Dombey Peruvian collection of *Arracacia elata* Wolff. *Arracacia*

dubia is attached to a Humboldt and Bonpland collection from Mexico, labelled *Ligusticum dubium* Kunth [non Sprengel 1806] and so published, as a later homonym (1821). This latter collection is actually of *Prionosciadium thapsoides* (DC.) Mathias, which de Candolle transferred from *Ligusticum* to *Elaeoselinum*, a genus unknown in the Americas.

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The excellent line drawing is the creation of Cecelia Freeman.

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