

A review of the infrageneric taxonomy and nomenclature of *Actinidia* (Actinidiaceae)

Xin-Wei Li & Jian-Qiang Li*

Wuhan Botanical Garden, the Chinese Academy of Sciences, Wuhan, 430074, China
(*corresponding author's e-mail: lijq@rose.whiob.ac.cn)

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The genus *Actinidia* Lindl. was traditionally divided into four sections, *Actinidia* sect. *Strigosae* H.L. Li, *Actinidia* sect. *Maculatae* Dunn, *Actinidia* sect. *Leiocarpae* Dunn, and *Actinidia* sect. *Stellatae* H.L. Li. However, *A.* sect. *Maculatae* was not published validly, and *A.* sect. *Leiocarpae* and *A.* sect. *Stellatae* lack types. In the present paper, the autonym, *Actinidia* sect. *Actinidia*, is proposed to replace *A.* sect. *Maculatae*, and *A.* sect. *Vestitae* to replace *A.* sect. *Stellatae*. Lectotypes are designated for *A.* sect. *Vestitae* and *A.* sect. *Leiocarpae*.

Key words: *Actinidia*, autonym, lectotype, nomenclature

The genus *Actinidia* Lindl. is of economic importance. The total area of kiwifruit orchards (*Actinidia chinensis* Planch. and *A. deliciosa* (A. Chevalier) C.F. Liang & A.R. Ferguson) is currently about 120 000 ha and the annual production exceeds 1.35 million tonnes of fresh fruit (Ferguson & Huang 2007). According to Li *et al.* (2007), *Actinidia* consists of about 55 species distributed in East and South Asia. The infrageneric classification of the genus has been debated. Gilg (1893) divided eight species of *Actinidia* into two groups, “*Monanthae*” for species with solitary flower inflorescence, and “*Pleianthae*” for those with cymes. Dunn (1911) carried out the first comprehensive study on the taxonomy of the genus, and established four sections: *A.* sect. *Ampulliferae* Dunn, *A.* sect. *Leiocarpae* Dunn, *A.* sect. *Maculatae* Dunn, and *A.* sect. *Vestitae* Dunn. Later, Li (1952) included *A.* sect. *Ampulliferae* into *A.* sect. *Leiocarpae*,

and split *A.* sect. *Vestitae* into two, *A.* sect. *Stellatae* H.L. Li and *A.* sect. *Strigosae* H.L. Li. This scheme was adopted by Wu (1977), Liang (1984), and Cui (2002). Liang (1984) further proposed two series under *A.* sect. *Leiocarpae* and *A.* sect. *Stellatae*.

Numerical taxonomy based on digitized morphological descriptors indicated that the genus should be split into three sections, *A.* sect. *Leiocarpae*, *A.* sect. *Maculatae* and *A.* sect. *Vestitae* (Huang *et al.* 1999). A cladistic analysis based on morphological characters by Li *et al.* (2000) suggested two subgenera, *A.* subg. *Leiocarpae* (Dunn) J.Q. Li including only *A.* sect. *Leiocarpae*, and *A.* subg. *Maculatae* (Dunn) J.Q. Li including *A.* sect. *Maculatae*, *A.* sect. *Strigosae*, and *A.* sect. *Stellatae*. He *et al.* (2000) carried out phenetic and cladistic studies of the genus using micromorphological characters of the leaf hairs and found *A.* sect. *Leiocarpae* to be mono-

phyletic, but the three others were not. Testolin and Ferguson (1997) used isozyme variation to evaluate Liang's system (Liang 1984), and their results were not well in line with the four-section scheme of Li (1952). RAPD and AFLP analyses revealed only *A. sect. Leiocarpae* as monophyletic (Huang *et al.* 2002, Li *et al.* 2005). However, Li *et al.* (2002) and Chat *et al.* (2004) showed *A. sect. Leiocarpae* to be paraphyletic, and the three other sections to be polyphyletic. Surprisingly all four sections were not monophyletic but polyphyletic in the analysis of PCR-RFLPs of mtDNA (Li *et al.* 2003).

Although previous studies (Testolin & Ferguson 1997, Huang *et al.* 1999, Li *et al.* 2000, He *et al.* 2000, Huang *et al.* 2002, Li *et al.* 2002, 2003, 2005, Chat *et al.* 2004) have provided an insight into the phylogeny of *Actinidia*, no agreement was reached on the infrageneric phylogeny of the genus, and no ideal scheme in line with morphological differentiation has been proposed or widely accepted. Apparently the infrageneric phylogeny of the genus needs further investigation. At the present time, we still accept the scheme of Li (1952), because it reflects the morphological differentiation among *Actinidia* species. However, the name *A. sect. Maculatae* was not published validly, and the names *A. sect. Leiocarpae* and *A. sect. Stellatae* lack types. To enable formal use of the names (Li 1952), the sectional nomenclature is reviewed here with adherence to the rules of the International Code of Botanical Nomenclature (McNeill *et al.* 2006).

Actinidia sect. Actinidia

“*Actinidia sect. Maculatae*” Dunn, J. Linn. Soc., Bot. 39: 405. 1911. — TYPE: *Actinidia callosa* Lindl.

When Dunn (1911) published his four sections, he automatically created the autonym (Art. 22.3 in McNeill *et al.* 2006), *Actinidia sect. Actinidia*. Furthermore, he included *A. callosa* Lindl., which was then (and still is) the type species of the genus *Actinidia*, within his “*A. sect. Maculatae*”, with the result that the latter designation was not validly published (Art. 22.2 in McNeill *et al.* 2006).

***Actinidia sect. Strigosae* H.L. Li**

J. Arnold Arbor. 33: 5. 1952. — TYPE: *Actinidia strigosa* Hook. f. & Thomson.

Under Art. 22.6 (McNeill *et al.* 2006), the type of the name *A. sect. Strigosae* is the same as that of *A. strigosa* Hook. f. & Thomson, because Li (1952) did not designate another type.

***Actinidia sect. Leiocarpae* Dunn**

J. Linn. Soc., Bot. 39: 404. 1911. — LECTOTYPE (designated here): *Actinidia kolomikta* (Maxim. & Rupr.) Maxim.

SYNONYM: *Actinidia sect. Ampulliferae* Dunn, J. Linn. Soc., Bot. 39: 402. 1911. — LECTOTYPE (designated here): *A. melanandra* Franch.

Actinidia sect. Ampulliferae and *A. sect. Leiocarpae* were established by Dunn (1911). Subsequently Li (1952) treated the former as a taxonomic synonym of the latter. We accept Li's treatment. Following Art. 11.5 (McNeill *et al.* 2006), *A. sect. Leiocarpae* has priority over *A. sect. Ampulliferae*.

Under Art. 10.5 (McNeill *et al.* 2006), we lectotypify *A. sect. Leiocarpae* with *A. kolomikta* and *A. sect. Ampulliferae* with *A. melanandra* Franch. We thus agree with Li (1952) that *A. kolomikta* and *A. melanandra* belong to the same section. Dunn (1911) included only one species, *A. kolomikta*, in *A. sect. Leiocarpae*, but he cited several other names of species in synonymy, including *A. platyphylla* A. Gray *ex* Miq., with a different type than *A. kolomikta*. *Actinidia melanandra* was put in *A. sect. Ampulliferae* by Dunn (1911). It has glabrous leaves and a bottle-shaped ovary, fitting better the protologue of *A. sect. Ampulliferae*, and a relatively wide geographic distribution.

***Actinidia sect. Vestitae* Dunn**

J. Linn. Soc., Bot. 39: 407. 1911. — LECTOTYPE (designated here): *A. chinensis* Planch.

SYNONYM: *Actinidia sect. Stellatae* H.L. Li, J. Arnold Arbor. 33: 5. 1952, *syn. nov.* — LECTOTYPE (designated here): *A. chinensis* Planch.

Li (1952) split *A. sect. Vestitae* into two

sections, placing all eligible elements as the lectotype of *A. sect. Vestitae* into either *A. sect. Stellatae* or *A. sect. Strigosae*. According to Art. 11.4 (McNeill *et al.* 2006), even when *A. sect. Vestitae* was split, this name should have been retained by Li (1952) for one of his sections. In the present paper, under Art. 10.5 (McNeill *et al.* 2006), we lectotypify both *A. sect. Vestitae* and *A. sect. Stellatae* with *A. chinensis*. So we accordingly treat *A. sect. Stellatae* as a junior taxonomic synonym of *A. sect. Vestitae*. *Actinidia chinensis*, which was placed in *A. sect. Vestitae* by Dunn (1911) and in *A. sect. Stellatae* by Li (1952), is widely distributed in China and is also widely cultivated in the world (Li 1952, Li *et al.* 2007).

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