**×Sinocalycalycanthus raulstonii** (Calycanthaceae): A New Intergeneric Hybrid between *Sinocalycanthus chinensis* and *Calycanthus floridus*

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Abstract. A morphological comparison of *Calycanthus* L., *Chimonanthus* Lindl., and *Sinocalycanthus* W.C. Cheng and S.Y. Chang is presented. Intergeneric crosses between *Sinocalycanthus chinensis* (W.C. Cheng and S.Y. Chang) W.C. Cheng and S.Y. Chang and *Calycanthus floridus* L. produced hybrid progeny. Data are presented comparing the parents and the progeny. *×Sinocalycalycanthus raulstonii* Lasseigne and Fantz is proposed as the name for these hybrids and is validated with a Latin diagnosis. The original cultivar is named ‘Hartlage Wine’.

Cultivated members of the Calycanthaceae Lindl. (sweetshrub family) found in the eastern United States and Europe historically included two species of deciduous shrubs valued for their fragrant flowers (Bean, 1970; Dirr, 1998; Flint, 1997; Griffiths, 1994; Krüssmann, 1984). The sweetshrub (Carolina allspice or strawberr shrub), *Calycanthus floridus* [synonyms: *C. fertilis* Walt. and *C. mohrii* (Small) Poll.], is native from Virginia south to Florida and China. The plant was in cultivation in 1726 (Dirr, 1998). Fragrant wintersweet, *Chimonanthus praecox*, Carolina allspice, Chinese wax shrub, fragrant wintersweet, strawberry-shrub, sweetshrub

Table 1. A comparison of genera in the Calycanthaceae.

| Character          | Chimonanthus | Calycanthus | Sinocalycanthus |
|--------------------|--------------|-------------|-----------------|
| Leaves             | Evergreen (1 deciduous) | Deciduous | Deciduous       |
| Flowers            | Axillary     | Terminal    | Terminal        |
| Color              | Yellow       | Brown to maroon | White to pale pink |
| Diameter           | 2 to 3 cm wide | 3 to 7 cm wide | 4.5 to 7 cm wide |
| Odor               | Fragrant     | Fragrant    | Nonfragrant     |
| Arrangement        | In two series | One series | In two series   |
| Inner row          | Small        | Lacking     | Small           |
| Stamens            | 5 to 30      | 5 to 30     | 18 to 20        |
| Fertile Filaments  | Lacking     | 10 to 30    | 11 to 12        |
| Number             | 4 to 6       | 2           | 1               |
| Origin             | China        | North America | China           |

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Materials and Methods

Richard Hartlage, then an undergraduate student in Horticultural Science at North Carolina State Univ., performed a series of reciprocal crosses between *Sinocalycanthus chinensis* and *Calycanthus floridus* in 1991. A single pseudocarp (seed pod) was produced. Raulston collected and stratified seeds for 3 months; four seedlings were transferred to field plots, one of which exhibited intermediate foliage, suggesting a hybrid. Flowers appeared 5 years later, confirming the hybrid origin.

Results and Discussion

The three genera in the Calycanthaceae are compared in Table 1. *Chimonanthus* is distinguished quickly from *Calycanthus* and *Sinocalycanthus* by its small, axillary flowers with few fertile stamens, staminodes lacking, and yellow outer perianth. In addition, plants are evergreen to semi-evergreen (only *Chimonanthus praecox* is deciduous).

The American Society for Horticultural Science (ASHS) replaced *Hortus Third* (Liberty Hyde Bailey Hortorium, 1976) with Griffiths (1994) as the official source for scientific names of plants. Griffiths (1994) does not recognize the genus *Sinocalycanthus*, regarding it as synonymous with *Calycanthus*. Currently, two views exist regarding generic classification: *Calycanthus* only (Flint, 1997;
Intergeneric hybridization between *S. chinensis* and *C. floridus* was obtained and constitutes the first intergeneric cross involving *Sinocalycanthus* and *Calycanthus*. The nothogenus *Sinocalycanthus* Lasseigne and Fantz is proposed for the generic name in accordance with Article H.6.2 (Greuter, 1994) that required the nothogenic name of a big-

### Table 2. Comparison of the genera *Calycanthus* (two species, North America) and *Sinocalycanthus* (one species, China).

| Character          | Calycanthus       | Sinocalycanthus |
|--------------------|-------------------|-----------------|
| Leaves             |                   |                 |
| Petioles           | Short             | Long            |
| Margin             | Entire            | Entire (or serrate) |
| Length             | 5 to 15 cm        | 16 to 25 cm     |
| Width              | 4 to 7 cm         | 10 to 12 cm     |
| Flowers            |                   |                 |
| Color              | Brownish-red*     | White, margins pink to purplish |
| Diameter           | 3 to 7 cm wide    | 4.5 to 7 cm wide |
| Odor               | Fragnant          | Nonfragnant     |
| Perianth           |                   |                 |
| Types              | One               | Two             |
| Arrangement        | Imbricate         | Two distinct series |
| Shape              | Narrow lanceolate to elliptic | Obovatspatulate to obovate |
| Stamens            | White             | Lacking         |
| Sap (crystals)     | Dusulate          | Distulosulate   |
| Shape              | Obovate-elliptic or prolute-elliptic | Elliptic or prolute-elliptic |
| Polarity           | Isopolar          | Heteropolar     |
| Symmetry           | Radial            | Bilateral       |
| Exine              | Psilate           | Verrucate-rugose |
| Pollen             |                   |                 |
| Series             | Psillate          | Verrucate-rugose |
| Shape              | Obovate           | Campanulate     |
| Fruit              |                   |                 |

*Calycanthus floridus* ‘Athens’ is one of a few yellow-flowered variants (Dirr, 1998).

### Table 3. A comparison of the hybrid with the parents *Sinocalycanthus chinensis* (female) and *C. floridus* (male).

| Character          | Sinocalycanthus chinensis (female) | Hybrid (male) | Calycanthus floridus (male) |
|--------------------|-----------------------------------|--------------|----------------------------|
| Leaf sizes         |                                   |              |                            |
| Petiole            | 7 to 11 mm                        | 7 to 12 mm   | 4 to 7 mm                  |
| Blade length       | 7 to 14 cm                        | 6 to 12.5 cm | 5 to 7.5 cm                |
| Blade width        | 3.5 to 9 cm                       | 3 to 7.5 cm  | 2 to 3.5 cm                |
| Apex acumen        | 9 to 13 mm                        | 5 to 15 mm   | 4 to 7 mm                  |
| Leaf blade         |                                   |              |                            |
| Teeth on margin    | Occasional, irregular             | Occasional, irregular | Lacking                  |
| Base               | Asymmetrical                      | Asymmetrical | Symmetrical                |
| Lateral veins      | 6 to 8 pairs                      | 5 to 7 pairs | 4 to 6 pairs               |
| Lower surface      | Green                             | Glauceascent | Glaucencest                |
| Leaf pubescence    |                                   |              |                            |
| Upper surface      | Glabrous                          | Scattered trichomes | Scattered trichomes        |
| Lower surface      | Glabrate                          | Pubescent veins | Pubescent veins            |
| Inflorescence      |                                   |              |                            |
| Flower buds        | Globular                          | Obovate to subglobular | Ellipsoid  |
| Flower stalk       | 15 to 25 mm                       | 10 to 15 mm  | 8 to 10 mm                 |
| Bracts             | Lacking                           | 2 - deciduous | 2 - one deciduous          |
| Bract length       | 11 to 14 mm long                  | 17 to 20 mm long | 3 to 5 mm                 |
| Flower odor        | Nonfragrant                       | Weakly fragrant | Fragrant                  |
| Receptacle width   | 8 to 9 mm                         | 5 to 6 mm    | 5 to 6 mm                  |
| Perianth           |                                   |              |                            |
| Color outer tepals | White tinged pink                 | Maroon wine red | Wine reddish-brown         |
| Color inner tepals | Yellow                            | Maroon wine red | Wine reddish-brown         |
| Apical edge color  | ± darker yellow                   | ± yellow to white | Wine reddish-brown         |
| Arrangement        | Two series                        | Two series   | One imbricate series       |
| Tepal apex         | Obtuse                            | Broadly acute | Acute                      |
| Width outer tepal  | 18 to 20 mm                       | 9 to 11 mm   | 3 to 5 mm                  |
| Width inner tepal  | 4 to 8 mm                         | 3 to 4 mm    | 1.5 to 3 mm                |
| Stamens            |                                   |              |                            |
| Filament length    | 1 mm                              | 0.5 mm       | 0.5 mm                     |
| Anther length      | 5 mm                              | 3.5 to 4 mm  | 3 mm                       |
| Connective exerted | ca 1 mm                           | ca 0.7 mm    | ca 0.5 mm                  |

### Conclusion

Intergeneric hybridization between *S. chinensis* and *C. floridus* was obtained and constitutes the first intergeneric cross involving *Sinocalycanthus* and *Calycanthus*. The nothogenus *Sinocalycanthus* Lasseigne and Fantz is proposed for the generic name in accordance with Article H.6.2 (Greuter, 1994) that required the nothogenic name of a big-
eneric hybrid to be a combination of the parents’ generic names in whole or in part. The new hybrid species is described as follows: *Nothospecies nova × Sinocalycanthus raulstonii* Lasseigne & Fantz [male *Sinocalycanthus chinensis* (W.C. Cheng and S.Y. Chang) W.C. Chang and S.Y. Chang × female *Calycanthus floridus* L.] *distinguibus folia asymetricius et infra glaucescentibus, petiolis elongatis, gemmis ovatis, pedicellus elongatais, et flores aromaticus cum tepalis biseriebus, elongatis, gemmis ovatis, pedicellus elongatis, et flores aromaticus cum tepalis biseriebus*, *amplitudine deminutis introrsum.*

Shrub, currently to 1.7 m tall × 1.3 m wide. Leaves are opposite, broad elliptic, acuminate (acumen 5 to 15 mm), asymmetrical basally, rotund, entire to occasionally irregularly serrate toward apex on largest leaves, green above and glaucescent below, 6 to 12.5 cm long, 3 to 7.5 cm wide; pubescence strigose on major veins below and scattered puberulent above with trichomes exhibiting a swollen bulbous base; petiole 7 to 12 mm. Flower buds obovoid to subglobose. Flowers (Fig. 1) solitary, terminal, weakly fragrant, maroon (RHS 70A-B to 60A) fading to wine-red (RHS 70A to 71A); pedicel 10- to 15-mm; bracts 2, one caducous, one deciduous, 11 to 14 mm long × 2 to 3 mm wide, borne 4 to 7 mm below the perianth; perianth of broadly obtuse tepals in two series, outer members spreading to weakly ascending, 18 to 25 mm long × 6 to 11-mm wide, inner members strongly ascending, 7 to 9 mm long × 3 to 4 mm wide, occasionally bearing pale yellow apices fading to white. Stamens numerous; fertile stamens on brownish fila-

**Fig. 1. Flowers of the parents and the intergeneric hybrid. Sinocalycanthus chinensis (left), (Sinocalycanthus raulstonii (center), and Calycanthus floridus (right).**