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**ABSTRACT.** Two putative hybrids between *Kalmia* and *Rhododendron*, their suspected progenitor species and related taxa were submitted to DNA sequencing of cpDNA trnL-F and nrDNA ITS regions in order to test whether there was DNA sequence evidence both for hybridization per se and for the direction of the cross should one be evident. Comparison of eight DNA sequences from these putative hybrids with *Rhododendron* and *Kalmia* species showed clear evidence of origin within *Rhododendron*. No evidence of *Kalmia* DNA was detected. These putative intergeneric hybrids appear to be mutants of *Rhododendron* and not of hybrid origin.

The hybrid of *Kalmia* and *Rhododendron* is the most genetically distant cross recorded in the *Ericaceae*. Three selections are attributed to this intergeneric hybrid. To date there have been no investigations into the status of these hybrids although the plants persist in cultivation.

Of several claimed intergeneric hybrids in the *Ericaceae*, the only ones that stand up to rigorous inspection are within tribe *Phyllodoceae Drude*, Engl. & Prantl. These are × *Kalmiothamnus*, × *Phylliopsis* and × *Phyllothamnus* and they represent crosses between *Kalmiopsis*, *Phyllodoce* and *Rhodothamnus*. This interfertility reflects the close relationship between these three genera. The only cross in this group that has not yet been performed successfully is that between *Kalmiopsis* and *Phylloco* (Starling, 1982).

Intergeneric crosses in other sections of the *Ericaceae* have all proved to be less resilient to taxonomic re-alignments. × *Gaulnettya* resides in *Gaultheria* now that *Pernettya* is sunk, × *Ledodendron* resides in *Rhododendron* now that *Luedum* is sunk and *Bruckenthalia* × *Erica* resides in *Erica* now that *Bruckenthalia* is sunk. × *Erieculluna* merely proved to be an abnormal *Erica*, not a hybrid with *Calluna*. This leaves us with one outstanding putative hybrid, that between *Kalmia* and *Rhododendron*. The former belongs to tribe *Phyllodoceae* and the latter to tribe *Rhodoreae* DC. ex Duby. Kron et al. (2002) show that these two tribes are quite distantly related. For example, they are no more related to each other than either is to *Empetreae* D. Don (which includes *Empetrum*). However, a hybrid between the two genera has been reported on two occasions with different *Rhododendron* parents.

The first reputed cross between *Kalmia* and *Rhododendron* was made in the 1950s by Halfdan Lem (1885-1969) in the USA, allegedly between *K. latifolia* and *R. williamsianum* (Pierce, 1974). The hybrid was reported as having “pinkish-white, cup-like flowers of all kalmias, but with a larger leaf resembling the male parent, *R. williamsianum*.” (Pierce, 1974). This established both the diagnostic characters of the hybrid and the direction of the cross. The one plant resulting from the hybridization was named ‘No Suchianum’ (sometimes styled as ‘Nosuchianum’) in jest by Warren Berg in 1973. Unfortunately, when the cultivar name was brought to the attention of International Cultivar Registration Authority for *Rhododendron* in 1996 it was noted that it fell foul of Article 17.9 of the *International Code of Nomenclature for Cultivated Plants* (Trehane et al., 1995) because it is styled in Latin. Therefore a new name, ‘Everlasting’, was coined by Pierce (Murray, 1996 in litt.). It is quite widely cultivated by enthusiasts in north-west USA (Halligan, 1994) and is favored for its long flowering season, perhaps caused by its apparent sterility, and its seemingly curious origin. ‘Everlasting’ is widely regarded as

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Table 1. Accession data for plant material used in DNA sequencing.

| Name | Source | Origin | Accession no. | ITS | trnL-F | EMBL ID no. |
|------|--------|--------|---------------|-----|--------|------------|
| ‘Everlasting’ a and b | RHS Garden, Wisley | Cult. | W20012690 | AJ626912 | AJ626918 |
| Hillier taxon a and b | Hillier Gardens & Arboretum | Cult. | H19841501 | AJ626913 | AJ626919 |
| *K. latifolia* a | RHS Garden, Wisley | Cult. | W951916 | AJ626914 | AJ626920 |
| *K. latifolia* b | RHS Garden, Wisley | Cult. | W960618 | AJ626915 | AJ626921 |
| *R. williamsianum* a | RHS Garden, Rosemoor | Cult. | R960393 | AJ626905 | AJ626916 |
| *R. williamsianum* b | RHS Garden, Rosemoor | Cult. | R888391 | AJ626906 | AJ626917 |
| *R. williamsianum* c | Glendoick Gardens | Wild | None | AJ626907 | AJ626923 |
| *R. maximum* | Glendoick Gardens | Wild | None | AJ626910 | AJ626924 |

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Table 2. EMBL accessions used in analysis of the cpDNA trnL-F region

| Species                  | EMBL ID          | Source               |
|--------------------------|------------------|----------------------|
| Bejaria aestuans         | AF394264         | Gao et al., 2003     |
| Cassiope fastigiata      | AF394265         | Gao et al., 2003     |
| Ledum palustre var. palustre | AF394252   | Gao et al., 2003     |
| Menziesia ciliacyx var. multiflora | AF452223 | Gao et al., 2003     |
| Menziesia pilosa         | AF452224         | Gao et al., 2003     |
| Rhododendron albidiflorum | AF394266     | Gao et al., 2003     |
| Rhododendron albrechtii  | AF452214         | Gao et al., 2003     |
| Rhododendron boninense   | AB038835, AB038885 | Ikenoue H.        |
| Rhododendron brachycarpum| AB038847, AB038897 | Ikenoue H.        |
| Rhododendron camtschaticum| AF394258     | Gao et al., 2003     |
| Rhododendron championae var. ovatifolium | AF452189 | Gao et al., 2003     |
| Rhododendron chilanthumense | AB038825, AB038875 | Ikenoue H.       |
| Rhododendron decandrum   | AB038809, AB038859 | Ikenoue H.      |
| Rhododendron degronianum | AB038845, AB038895 | Ikenoue H.      |
| Rhododendron dilatatum   | AB038807, AB038857 | Gao et al., 2003 |
| Rhododendron duclouxii   | AF452210         | Gao et al., 2003     |
| Rhododendron ellipticum  | AF394262         | Gao et al., 2003     |
| Rhododendron ferrugineum | AF394254         | Gao et al., 2003     |
| Rhododendron fortunei    | AF394247         | Gao L.M.             |
| Rhododendron hancockii   | AF452192         | Gao et al., 2003     |
| Rhododendron henryi      | AF452193         | Gao et al., 2003     |
| Rhododendron kiusianum   | AF394263         | Gao et al., 2003     |
| Rhododendron latoucheae  | AF394262         | Gao L.M.             |
| Rhododendron luteum      | AF394263         | Gao et al., 2003     |
| Rhododendron mackenzianum| AF452196         | Gao et al., 2003     |
| Rhododendron mariesii    | AB038800, AB038850 | Ikenoue H.   |
| Rhododendron mesochalum  | AB038843, AB038893 | Ikenoue H.     |
| Rhododendron molle       | AB038841, AB038891 | Ikenoue H.   |
| Rhododendron moupinense  | AF452194         | Gao et al., 2003     |
| Rhododendron murinolatum | AB038894         | Ikenoue H.           |
| Rhododendron nertiforum  | AF394248         | Gao et al., 2003     |
| Rhododendron nipponicum  | AF452215         | Gao et al., 2003     |
| Rhododendron occidentale | AF396216, AF396215 | Fritsch P.W., Morton C.M., Chen T., Meldrum C. |
| Rhododendron oldhamii    | AB038832, AB038882 | Ikenoue H., Kurashige Y., Ueda K. |
| Rhododendron ovatum      | AF452204         | Gao et al., 2003     |
| Rhododendron pachypodum  | AF394249         | Gao L.M.             |
| Rhododendron pentaphyllum| AB038840, AB038890 | Ikenoue H., Kurashige Y., Ueda K. |
| Rhododendron ponticum    | AF452222         | Gao et al., 2003     |
| Rhododendron primuliflorum | AF394255   | Gao et al., 2003     |
| Rhododendron quinquefolium| AB038838, AB038888 | Ikenoue H.   |
| Rhododendron racemosum   | AF394250         | Gao L.M.             |
| Rhododendron redowskianum| AF394257         | Gao et al., 2003     |
| Rhododendron reticulatum | AB038824, AB038874 | Ikenoue H., Kurashige Y., Ueda K. |
| Rhododendron rubripilosum | AB038830, AB038880 | Ikenoue H., Kurashige Y., Ueda K. |
| Rhododendron sanum      | AB038804, AB038853 | Ikenoue H. |
| Rhododendron santapau    | AF452207         | Gao et al., 2003     |
| Rhododendron schlippenbachii | AF452213     | Gao et al., 2003     |
| Rhododendron semibarbatum| AF452206        | Gao et al., 2003     |
| Rhododendron serpyllifolium| AB038834, AB038884 | Ikenoue H., Kurashige Y., Ueda K. |
| Rhododendron simii       | AF452216         | Gao et al., 2003     |
| Rhododendron spiciferum  | AF452208         | Gao et al., 2003     |
| Rhododendron spinuliferum| AF452209         | Gao et al., 2003     |
| Rhododendron stamineum   | AF394261         | Gao L.M.             |
| Rhododendron stamineum var. gauzihiense | AF452197 | Gao et al., 2003     |
| Rhododendron subestipitum| AF394290         | Gao et al., 2003     |
| Rhododendron trichocladum| AF394253         | Gao et al., 2003     |
| Rhododendron tsugisianense| AB038871, AB038821 | Ikenoue H. |
| Rhododendron tsujiophyllum| AF452217        | Gao et al., 2003     |
| Rhododendron vialii      | AF452205         | Gao et al., 2003     |
| Rhododendron wadanum     | AF452218         | Gao et al., 2003     |
| Rhododendron weyrichi    | AB038802, AB038852 | Ikenoue H.   |
| Rhododendron yakamontanum| AB038820, AB038870 | Ikenoue H.   |
Table 3. EMBL accessions used in analysis of nrDNA ITS region

| Species                  | EMBL ID  | Source                                      |
|--------------------------|----------|---------------------------------------------|
| Gaultheria itoana        | AF432430 | Tsai C.C., Chen C.H., Chou C.H.             |
| Gaultheria taiwaniana    | AF432429 | Tsai C.C., Chen C.H., Chou C.H.             |
| Kalmia angustifolia      | U48599   | Kron K.A., King J.M.                       |
| Kalmia canadensis        | U48603   | Kron K.A., King J.M.                       |
| Kalmia hirsuta           | U48601   | Kron K.A., King J.M.                       |
| Kalmia latifolia         | U48600   | Kron K.A., King J.M.                       |
| Kalmia micropyllica      | U48598   | Kron K.A., King J.M.                       |
| Kalmia occidentalis      | U48602   | Kron K.A., King J.M.                       |
| Rhododendron alabamense  | AF072478 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron albiflorum  | RA28558S | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron anthopogon  | RA5828SR | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron arborescens | AF072477 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron argyrophyllum| RA5828S  | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron atlanticum  | AF072479 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron breviperatum| AF285853 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron camtschaticum| RC5828S | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron canadense   | RCRRNAIT9| Volckaert G.                                |
| Rhododendron ellipticum  | AF285841 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron ferrugineum | RF5828S1 | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron flavum      | AF072483 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron formosanum  | AF297190 | Shih B.-L., Yang Y.-P., Chaw S.-M.          |
| Rhododendron hongkongense| RH5828S  | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron hyperythrum | AF297192 | Shih B.-L., Yang Y.-P., Chaw S.-M.          |
| Rhododendron javanicum   | RJ5828S  | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron kaempferi   | AB080082 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron kwakamii    | AF432420 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron kiusianum   | RRRNAIT3 | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron lamprophyllum| AF285855 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron lastostylum | AF285845 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron leptanum    | RL5828S  | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron luteum      | AF072485 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron mariesii    | AF285844 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron molle       | RM5828SR | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron morii       | AF297198 | Shih B.-L., Yang Y.-P., Chaw S.-M.          |
| Rhododendron moulmainense| RM5828S  | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron occidentale | AF072487 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron oldhamii    | AF285843 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron ovatum      | AF393424 | Gao L.M., Li D.L., Yang J.B.                |
| Rhododendron ponticum    | RP5828S  | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron pseudochrysanum| AF297196 | Shih B.-L., Yang Y.-P., Chaw S.-M.          |
| Rhododendron reticulatum | RRRNAIT6 | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron rubropilosum| AF285849 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron rubropunctatum| AF432442| Tsai C.C., Chen C.H., Chou C.H.             |
| Rhododendron schlippenbachii| RSRRNAIT8| Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron semibarbatum| AB080083 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron simii       | AF285848 | Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron taiwanalpinum| AF352479| Tsai C.C., Chen C.H., Huang S.C.            |
| Rhododendron tschonoskii| RRRNAIT4 | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron tussilugum  | RT5828S  | Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
| Rhododendron vaseyi      | AF072491 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron viscosum    | AF072492 | Scheiber S.M., Jarret R.L., Robacker C.D.   |
| Rhododendron wadanum     | RWRRNAIT5| Volckaert G.                                |
| Rhododendron yedoense    | RYRRNAIT1| Aert R., Hyam R., Chamberlain D., Karp A., Volckaert G. |
being an intergeneric hybrid on the basis of its claimed parentage, apparent sterility and the seemingly Kalmia-like characters of a shallow saucer-shaped corolla and widely spreading stamens. Despite the corolla and stamen characters there do not appear to be any other features of the flower that suggest an affinity with Kalmia. ‘Everlasting’ was reputedly crossed with R. arboreum subsp. delavayi resulting in a cultivar called ‘Brilliant Abbé’ (Anon, 1985). The latter reference erroneously lists one parent as ‘Brilliancy’ (Murray, 1996 in litt.).

The second reputed cross between Kalmia and Rhododendron is represented by a plant (hereafter referred to as the Hillier taxon) in the collection at the Sir Harold Hillier Gardens and Arboretum in England. It was thought to represent a hybrid between K. latifolia and R. maximum originating in America (Hillier and Sons, 1981) but subsequent editions (e.g., Hillier and Coombes, 2002) have been more cautious and listed it under R. maximum. Likewise, Jaynes (1997) has questioned its intergeneric status. The Hillier taxon is also grown at Arboretum Trompenburg in the Netherlands where it is listed as an intergeneric hybrid (van Hoey Smith, 2001) and at the US National Arboretum (Jaynes, 1997). The reported evidence for hybridity is on the basis of the tendency of its flower buds to abort (Coombes, pers. comm.; Fortgens, pers. comm.) and its long petiole relative to length of leaf lamina, the latter character is reminiscent of K. latifolia. It has been suggested that its reluctance to flower is because Rhododendron flower buds develop on shoots of the previous season whereas those of Kalmia develop on shoots of the current season.

Claims for intergeneric status of various hybrids are made on a fairly regular basis by horticulturists. Such pronouncements are usually worth investigating, not least because of what they may tell us about the relatedness of the genera in question. These two cases demand investigation because, if their parental status could be proved, they would represent the most distant intergeneric hybrids in Ericaceae and this would have important taxonomic implications. Additionally, as Kalmia and Rhododendron are widely grown and appreciated in ornamental horticulture, there would be interesting potential breeding consequences between these two attractive woody genera. As International Cultivar Registration Authority for the genus Rhododendron, the Royal Horticultural Society has an interest in putative hybrids between Rhododendron and other genera. We therefore decided to submit material of the two available cultivars and related species to DNA sequencing of the trnL-F region and ITS regions in order to test whether there was DNA sequence evidence both for hybridization per se and for the direction of the cross should one be evident.

**Materials and Methods**

Plant material was obtained from the Royal Horticultural Society’s gardens at Wisley and Rosemoor (England), the Sir Harold Hillier Gardens and Arboretum (England) and Glendoick Gardens (Scotland) (Table 1). Leaves were collected on to silica gel and stored at room temperature.

DNA was extracted using the CTAB technique (Doyle and Doyle, 1987) and stored in TE buffer at 5 °C while in use. PCR amplification of the nrDNA ITS regions followed Compton et al. (1998a) and cpDNA trnL-F followed Compton et al. (1998b). DNA sequencing, sequence editing and DNA sequence alignment was performed following Compton et al. (1998b).

Additional DNA sequences were available for both ITS and trnL-F regions from the EMBL/Genbank/DDBJ database of nucleotide sequences. The analysis of these sequences, in addition to our own new sequences, was necessary in order to answer the question of relationships in the absence of a published phylogeny. Species and identification numbers are given in Tables 2 and 3.

Alignments were saved as Nexus files and analyzed in PAUP*4.0b10 (Swofford, 2002) under Parsimony. The trnL-F region of the 1440 most parsimonious trees resulting from analysis of the cpDNA trnL-F sequence data. Heavy lines indicate bootstrap support >50%
analysis consisted of 79 taxa including 2 outgroups (Cassiope fastigiata and Bejaria aestuans) and 930 characters. The ITS analysis consisted of 64 taxa including two outgroups (Gaultheria itoana and G. taiwaniana) and 709 characters. Analyses were conducted separately because the relationship of hybrid material would differ with the pattern of inheritance of the DNA region and conflict would result in artifactually low resolution of the cladogram. Heuristic searches were performed using 100 sequence addition replicates and TBR. Most parsimonious trees were stored and a strict consensus established. Clade support was established using 1000 Bootstrap replicates using the fast swapping option.

Results

The cpDNA trnL-F analysis resulted in 1440 most parsimonious trees of 329 steps (C.I. 0.805, R.I. 0.908) differing in the placement of a small number of species within groups that showed very little sequence divergence. The first most parsimonious tree is shown here (Fig. 1) with bootstrap support marked on appropriate branches. Rhododendron is a paraphyletic group that contains three species (R. camtschaticum, R. redowskianum, R. albrechtii) distantly related to the main generic diversification (clade A). Within this clade species of Ledum and Menziesia are nested. Clade A contains two main groups one of which includes both putative intergeneric hybrids. ‘Everlasting’ is identical in sequence to R. brachycarpum and the Hillier taxon is identical in sequence to R. maximum.

The nrDNA ITS analysis resulted in 231655 most parsimonious trees of 532 steps (C.I. 0.742, R.I. 0.847) differing in the placement of a small number of species within groups that showed very little sequence divergence. The first most parsimonious tree is shown here (Fig. 2) with bootstrap support marked on appropriate branches. Rhododendron forms a monophyletic group in which R. camtschaticum is a sister lineage to the rest of the genus. The same two major groups can be identified within Rhododendron even though the species sampling is somewhat different. Again, both putative hybrids occur in the same clade. ‘Everlasting’ has no exact match (note R. brachycarpum was not available for this analysis) but groups with R. williamsianum and its close relatives. The ITS analysis lacked R. brachycarpum as material was not available. The combination of both chloroplast and nuclear DNA

Discussion

‘Everlasting’, Pierce (1974) records Kalinia latifolia as the seed parent of ‘Everlasting’, although he is not the originator of this cultivar. Evidence from cpDNA trnL-F sequence data indicates a seed parent in Rhododendron and an exact match with R. brachycarpum for one replicate of ‘Everlasting’. The inference is that at least the seed parent was either R. brachycarpum, a close relative, or hybrid, of it. This indicates that the record of the direction of the hybrid by Pierce can not be correct without unusual inheritance of the cpDNA from the male parent. The evidence from nrDNA ITS again shows very close affinity with Rhododendron species, particularly the R. williamsianum group. The ITS analysis lacked R. brachycarpum as material was not available. The combination of both chloroplast and nuclear DNA
evidence indicates that *Kalmia* has not contributed to the genetic makeup of ‘Everlasting’ but that the cultivar is derived from within a group of closely related *Rhododendron* species.

**Hillier taxon.** The Hillier taxon is of putative *R. maximum* × *K. latifolia* origin (Hillier and Sons, 1981). Both samples of this material group with *R. maximum* in the cpDNA trnL−F analysis and have identical sequence to it. This would allow *R. maximum* as the putative seed parent. The evidence from nrDNA ITS again shows very close affinity with *Rhododendron* species and again an exact match of one sample (Hillier taxon a) with *R. maximum.* The ITS data show no evidence of hybridization with *Kalmia* and indicate strongly that this taxon is not of hybrid origin. Like ‘Everlasting’ only *Rhododendron* shows evidence of genetic contribution to this taxon.

**Hybrid status.** Evidence of female parentage for each of the two putative hybrids was established using cpDNA trnL−F sequencing based on the usual female-only mode of inheritance of this DNA (Palmer, 1985) and a neutral pattern of nucleotide substitution (Bakker et al., 2000). It is evident that the putative hybrids both are nested well within the genus *Rhododendron* and consequently are inferred to have had a *Rhododendron* seed parent. The sequence divergence among closely related species is very low and sometimes zero. The consequence is that we can be sure of the female *Rhododendron* origin of each putative hybrid but can confirm the identity only to species group with confidence. The nrDNA ITS sequences can be expected to show inheritance from both parents, particularly as these plants are the F1 generation and there has been no chance of segregation. *Kalmia* and *Rhododendron* show considerable divergence in ITS sequence and recombination of these differing ITS types would be easily detected. In the Hillier taxon and ‘Everlasting’ the nrDNA ITS sequences show a close match with species in *Rhododendron.* Again, the levels of sequence divergence allow identification of the parents to species group only.

The stated origin of ‘Everlasting’ as *Kalmia latifolia* (female) and *Rhododendron williamsonianum* (male) (Pierce, 1974) is refuted by the DNA sequence evidence. Neither sequence shows origin in *Kalmia* and both show identity with at least one species of *Rhododendron* that was sampled. The Hillier taxon also shows no sign of *Kalmia* in either DNA sequence and a match to *Rhododendron* maximum in both sequences.

When treated as a *Rhododendron,* ‘Everlasting’ can be identified to subsection *Pontica* Sleumer in section *Ponticum* G. Don in the key to subgenus *Hymenanthes* (Blume) K. Koch (Chamberlain, 1982), except for the corolla lobe to tube ratio. The morphology of this plant fits the placement of the cultivar into subsection *Pontica* very well. Thus we see concordance of the molecular and morphological evidence. The open corolla tube is probably the result of a mutation in the genes controlling floral development. The Hillier taxon sometimes produces flower buds but these abort, therefore the lack of available flowers prevents this being keyed out. The evidence suggests that this, like ‘Everlasting,’ is a chance mutant of a *Rhododendron.*

The balance of evidence, both indirect and supports the recognition of these unusual plants as *Rhododendron* mutants. The desire to see new and novel hybrids between two genera of the spectacular shrubby *Ericaceae* may have influenced uncritical reports of hybridization. It is notable that in neither case has anyone directly claimed in print to have made the hybrid. The driving evidence to suggest hybridity has been minor changes in floral structure, leaf shape and lack of seed production.

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