

Analysis of a Hybrid Iris near Elmira, Lane County, Oregon

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HYBRIDIZATION BETWEEN *Iris tenax* Dougl. subsp. *tenax* and *Iris tenax* Dougl. subsp. *chrysophylla* (Howell) Clarkson has been discussed at some length in various reports (Lenz, 1958; Smith and Clarkson, 1956; Clarkson, 1959a,b). In the cases discussed, hybridization has for the most part been recent and introgressive in the direction of *I. tenax tenax*. It was suggested (Clarkson, 1959a) that variability in *I. t. tenax* is in part due to hybridization during a period when *I. t. chrysophylla* was more widespread in distribution, but no extensive evidence of past crossing could be cited. The discovery of a rather widespread hybrid colony near Elmira, Lane County, Oregon, by the junior author provides a good example of a presumably ancient crossing as well as hybridization between these subspecies which is not introgressive.

Description of Habitats

The hybrid occurs in small colonies in an area of approximately 25 square miles between Elmira and Noti, Oregon, about 20 miles west of Eugene. The area is characterized by Douglas fir (*Pseudotsuga menziesii* (Mirbel) Franco] as the major tree with considerable Oregon oak (*Quercus garryana* Dougl.), Madrone (*Arbutus menziesii* Pursh), and Ponderosa pine (*Pinus ponderosa* Dougl.). The latter is reproducing well in several small stands, particularly just west of Elmira. Much of the total area where the hybrid occurs tends to be open because of logging, construction of homes, or because of roads which dissect the area.

Herbs, small shrubs, and young trees occupy the opened areas along with the *Iris* hybrid. The more common of these are listed in Table 1, although seasonal and site predominance varies. However, the general pattern of associated species is that of *I. tenax tenax* as discussed by Clarkson (1959b).

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TABLE 1

HERBS, SMALL SHRUBS, AND YOUNG TREES ASSOCIATED WITH *Iris* HYBRIDS

<i>Pteridium aquilinum pubescens</i>	<i>Fragaria bracteata</i>
<i>Pinus ponderosa</i>	<i>Rubus vitifolius</i>
<i>Pseudotsuga menziesii</i>	<i>Cytisus scoparius</i>
<i>Camassia quamash</i>	<i>Daucus carota</i>
<i>Avena sativa</i>	<i>Arbutus menziesii</i>
<i>Bromus</i> sp. (not in flower)	<i>Plantago lanceolata</i>
<i>Holcus lanatus</i>	<i>Hypochaeris radicata</i>
<i>Ranunculus occidentalis</i>	

The soil is a sandy loam with very few rocks. It, too, is characteristic of *I. t. tenax* habitats rather than that of *I. t. chrysophylla*.

Analysis of Hybrids

In general aspect the hybrids appear to resemble *I. t. chrysophylla* except for flower color which is blue with a reddish cast rather than the characteristic pale yellow. However, when analyzed by a modification of techniques suggested by Anderson (1949), they are found to be more nearly intermediate except where currently interbreeding with *I. t. tenax*. No *I. t. chrysophylla* is near enough for present-day cross pollination.

Individual plants from four colonies were scored on a zero to three basis for seven characteristics. When considered typical of *I. t. chrysophylla*, each trait was scored as zero, and when considered typical of *I. t. tenax*, scored as three. Intermediates were then evaluated as more like one or the other subspecies and scored as one or two, respectively. Representatives considered typical of the subspecies were at hand for comparison. The seven characteristics used are presented in Table 2.

TABLE 2

CHARACTERISTIC OF *I. tenax tenax* AND *I. tenax chrysophylla* USED FOR SCORING

	<i>I. t. tenax</i>	<i>I. t. chrysophylla</i>
Flower color	Dark blue to purple	Pale yellow
Petal width	2-3 cm. at widest part	About 1 cm. at widest part
Perianth tube length	1 cm. or less	5-12 cm.
Stem	40 cm. or more in length	Absent
Bract length	3-5 cm.	12-18 cm.
Bract shape	Linear	Lanceolate
Bract position	Alternate	Opposite

TABLE 3

ANALYSIS OF FOUR COLONIES OF HYBRID *Iris*, *I. t. tenax* X *I. t. chrysocephala*

Characteristic	Colony A (15 in sample)	Colony B (5 in sample)	Colony C (13 in sample)	Colony D (7 in sample)
Flower color	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 2 2 2 2	2 3 3 3 3 3 3 3 3 3 3 3 2	3 3 3 3 3 3 3
Petal width	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	3 3 3 3 3	3 3 3 3 3 3 3 3 3 3 3 3 2	3 3 3 3 3 3 3
Perianth tube length	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 2 2 0 0 0 0 0 0 0 1 0	2 0 0 0 2 0 0
Stem	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0	0 3 3 0 0 0 1 0 1 1 0 1 0	1 1 0 0 3 2 1
Bract length	2 2 2 3 2 3 2 2 3 3 3 2 3 3 3	1 1 1 0 1	1 2 1 2 0 0 0 1 1 0 3 0 1	2 0 0 0 2 0 0
Bract shape	2 2 2 2 2 3 2 2 3 3 3 2 3 2 2	1 1 1 1 1	2 3 1 1 1 0 0 1 2 2 2 0 3	3 1 0 1 2 0 1
Bract position	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0	0 2 0 0 0 0 0 0 0 0 0 0 0	1 0 0 0 3 0 0

Many of these characteristics are quantitative and could be evaluated by actual measurement. However, the number of plants available for analysis is relatively few, and subspecies differences for these traits are so pronounced that rigorous biometric methods seem neither necessary nor valid.

Table 3 presents the results of analysis of four colonies of the hybrid. Size of sample is variable because some colonies are quite small. Colony A, two miles west of Elmira along the Noti road, is the best developed of the hybrid colonies. It is the only colony in which some present-day backcrossing to *I. t. tenax* is unlikely.

Summary

As Table 3 indicates, the hybrids tend to resemble *I. t. chrysophylla* in regard to perianth tube length, stem length, and bract position and to resemble *I. t. tenax* in regard to flower color, petal width, bract shape, and bract length. Colony A, where no backcrossing to *I. t. tenax* seems to be occurring, is the most uniform of the four colonies sampled, as might be expected.

Ecologically, as has been pointed out, the hybrids occupy habitats typical of *I. t. tenax* and probably have persisted in the area because of this. Because of these ecological conditions, the hybrid seems certain to be swamped by surrounding *I. t. tenax* colonies but probably not for a considerable number of years. Moreover, hybrid flowering occurs most abundantly in March and April rather than May and early June as in the parental subspecies, and this should contribute to stability of the hybrid colonies.

The arguments for a one-time extensive distribution of *I. t. chrysophylla* in the coast range of Oregon have been presented by Clarkson (1959a). The uniformity of these hybrid colonies, plus the fact that *I. t. chrysophylla* is now no nearer than at least 15 miles, suggests that they originated during the time *I. t. chrysophylla* was widespread. This could have been from four to eight thousand years ago. Since their origin, they have been a source of morphological variability for *I. t. tenax*.

Taxonomic distinction for the hybrid is considered unnecessary since it is not widespread, does not occupy an ecological niche distinct from both parents, and is surrounded geographically by *I. t. tenax*. These reasons are advanced not to define the subspecies but to clarify the senior author's application of that category to this group of plants. An English name such as "Noti hybrid" or "Noti race" seems sufficiently precise to identify the individuals concerned without overburdening the literature of the western American *Iris* with trinomials.

Literature Cited

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