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The Toromiro is a member of the "Edwardsia" group within the genus *Sophora*. In 1917, it was described by Skottsberg (1920-56) as a new species, from a single surviving tree found in the vast extinct crater, Rano Kao, on Easter Islands. The last scientist to see this tree alive was probably the Norwegian, Thor Heyerdahl, during his stay in 1955-56. Soon after, the tree died, and the Toromiro had become extinct in its wild habitat (Schlätzer, 1965).

In 1966-68, on invitation by the Chilean Ministry of Agriculture, G. Schlätzer carried out a restoration of the Toromiro to its native habitat. Seeds were received from Christchurch Botanic Garden, New Zealand, from a single Toromiro growing in their parks. A fence was placed across the foot of Rano Kao, and behind that many Toromiros were planted, among many other species in plantations covering some 60 hectares, including Toromiros, hidden in almost inaccessible nooks inside Rano Kao.

Christchurch Botanic Garden is not the only garden to count a Toromiro in its collection. When Thor Heyerdahl planned his expedition to Easter Island, he was asked by the Swedish Professor, Olof H. Selling, of Stockholm, to bring seeds from the Toromiro tree. Professor Selling donated these seeds to the Botanic Garden of Gothenburg, Sweden, and from them were raised three plants. Based on these three plants, Gothenburg Botanic Garden has recently run its own restoration scheme, culminating in a trip by Dr Björn Aldén of Gothenburg, who flew a couple of rooted scions of Toromiro to Easter Island and had them planted outside Rano Kao, in the presence of Thor Heyerdahl and a camera crew. These plants died later on.

This information is published in a paper by Dr Aldén (1990), which was subsequently shown to the present senior author of this paper as it includes some points of criticism of his project in Easter Island. Thus, Aldén alleged that all the formerly planted Toromiros had died; that they were seedlings of a New Zealand *Sophora microphylla*, mistaken by Christchurch Botanic Garden for a Toromiro, and that the botanic garden had admitted their tree to be a misnomer.

This was puzzling. Could a well-reputed botanic garden like Christchurch really make such a mistake? And how could Aldén know the fate of the Toromiros hidden among the boulders of Rano Kao, when he not even had approached the former project-leader for information? We decided to investigate his allegations.

Does the Toromiro Still Grow in Easter Island?

In a television documentary film made in 1991 by the Chilean, Francisco Roca, it is stated that plants of the Toromiro are still to be found in the Rano Kao. Since the Gothenburg plants were planted outside Rano Kao, this statement can only refer to plants surviving from the project of 1966-68 or, less likely, to hitherto unknown, surviving original plants.

In 1966-68, we hid some of the Toromiro plants because of the fame and former use of the tree for the famous wood carvings. Already at that time, common guava was spreading fast and has since then provided further cover. With this in mind and with the information from Roca's film, it seems likely that some of the plants from that first restoration scheme are still alive and growing in the Rano Kao area, and perhaps elsewhere.

But are they Toromiros?

In his paper, Aldén (1990) claimed the Toromiro-tree in Christchurch to be a misnomer: in reality a New Zealand *Sophora microphylla*, and that the Christchurch Botanic Garden should have admitted this. But in a letter of 18th January, 1991, to one of us (G.S.), the Botanical Officer, Mrs V.J. McNaughton of that Garden states that they do indeed consider this tree to be a Toromiro. She even adds that this particular tree flowers at a different time from surrounding *Sophoras*, thus excluding the chance of cross-pollination. Obviously, this information contradicts that given by Aldén.

When comparing his plants in Gothenburg with material from the tree at Christchurch, Aldén finds the latter to have 1) larger flowers (but does not say by how much), 2) rusty calyx-hairs, and 3) deviating leaves (no details given), from which he concludes the Christchurch-tree to be an *S. microphylla*. He does not describe his seeds from Christchurch.

Neither Skottsberg nor Zizka (1991) discuss the total size of the Toromiro's flowers (Skottsberg never saw them) and as to colour of hairs, Zizka only mentions those of the leaflets, which he describes as "whitish to brownish". It is interesting to us that Skottsberg notes seedlings of a *Sophora* from Juan Fernandez to deviate from their parents by being nearly naked - "probably a direct result of greenhouse life" (Skottsberg, 1920-56, p.138).

We should also point out that there is strong morphological variation within the species of the "Edwardsia" group, which implies that even if all known Toromiro plants today should derive from the same specimen, a certain variation may be expected, for instance, as to the size of flowers and leaves.

According to Aldén (1990), the leaves of the Christchurch Toromiro yield the final proof that this plant is a *Sophora microphylla*. Only, this cannot be substantiated from the colour of the hairs (Godley, 1989), nor from the form of the leaflets, due to Skottsberg's remarks on those of *S. microphylla* (Skottsberg, 1920-56, p.138). Nor even the leaf surface morphology can be used (Aldén & Zizka, 1989, p.147). The number of leaflet pairs of the imparipinnate leaves is left, therefore, as the most reliable character (Zizka, 1991). Zizka notes that the Toromiro has 8-12(-20) pairs of leaflets, which may be compared with Godley (1989) who found 17-22 pairs on the Christchurch plant. Again, one might recall the strong genetic variation of these plants, which may be illustrated by G. Schlützer's, observations of *Sophora macrocarpa* in Chile. Representative leaves taken from plants within the same estate, both plants well exposed, show a variation which renders the observer doubtful as to the reliability of leaflet numbers as a means to distinguish these species (fig. 1).

As to seed characters, the batches used by Schlätzer were estimated to be very similar to the observations by Skottsberg (1920-56, p.74), who found the seeds to measure 4.2-5 x 3.5-4 mm, while Godley (1989) finds seeds of the Christchurch-tree to measure 4-6 x 4-4.5mm. He describes the colour as dark yellow against Skottsberg's "fulvous". Godley then proceeds to call the Christchurch-tree an *S. microphylla* with smaller than average seeds!

Finally, the size of the plant should be discussed. The 5m. tall Christchurch-tree was considered to be too tall (Godley, 1989), as compared with the tree in Easter Island which Skottsberg measured to 1.9m., while Zizka (1991) puts the possible maximum at some 3m. In Valparaíso, Chile, a Toromiro grown for half a century is no taller than a man. Valparaíso receives 462mm. precipitation a year, with a summer minimum (Cappelen et al., 1987), and although Easter Island receives 1,274mm. evenly distributed over the year (Cappelen et al., 1987), most soils there now lack phosphorus so much as to render fertilizing necessary for nitrogen-fixing crops to succeed (Wright et al., 1962, p.54). Thus, plants in good soils and with the 669mm. precipitation of Christchurch might be expected to grow to larger proportions, perhaps to the size indicated by the old Easter Island wood carvings, which presuppose Toromiro-trunks at least 0.2m. thick (Skottsberg, 1920-56, p.74).

Summing up, we find that neither Aldén nor Godley has produced one indisputable character to prove that the Christchurch tree cannot safely be considered a Toromiro.

Is the Toromiro a Well Defined Species?

As indicated by our discussion, the Toromiro's taxonomic status is dubious when considered within the "Edwardsia" complex. This complex yields one of the finest examples of an antarctic-circumpolar distribution, with closely related species (or subspecies) occurring in Lord Howe Islands, New Zealand, Chatham, Raivavae, Rapa, Marquesas, Easter Island, Masafuera, Masatierra, Chile, Gough Island, and Réunion, all once considered as a single species, *S. tetraptera* J. Mull., with further species in New Zealand, Hawaii and Chile.

Skottsberg (1920-56, p. 262) found it less important whether the members of the *S. tetraptera* group were given specific or sub-specific status, but he felt convinced that these plants could not spread by sea. However, it appears that some seeds can float and retain their viability in sea water for at least 3 years, and seeds have been found on beaches of Chiloe and Kermadec Islands (Sykes and Godley, 1968).

When comparing plants from Gough, Chile and New Zealand, Sykes and Godley (1968) found them to be races of *S. microphylla*, and in plants from these three localities, as well as from the Chatham Islands, they found the same chromosome number of 2n=18. Finally, Godley feels sure that the Toromiro is part of the variable species, *S. microphylla* (Godley, 1989).

Summing up our knowledge today, we conclude that the Toromiro can hardly rank as a well defined species but rather as a geographical race of a polymorphic *Sophora* species (*microphylla*?).

Conclusion

The Toromiro is of major importance to the mythology and potential wood carving industry of the islanders of Easter Island. Seen in this light, the attempts to save and reintroduce this tree are praiseworthy and humane. But if we consider its dubious taxonomic status and compare it with the proliferation of well defined plant species in need of help, there may well be better candidates deserving of our conservation efforts.