

# Three *Gormania* river basin endemics

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A search for succulents in the river valleys of the Pacific side of the USA reveals three interesting and rare species of *Gormania*, characterised and illustrated here. Photography by the author.

The isolation of being separated on individual islands of the Galapagos allowed the flora and fauna of each island to evolve independently, and observing this was the trigger for Darwin's ideas on speciation. Similarly, in densely forested areas, the

only niches for succulents to grow and develop are on distant mountain-tops (above the tree line), or in the remoteness of the dry bluffs and cliffs of river valleys where populations of plants have evolved their own particular species characteristics. In the heavily-wooded

regions of north-western USA, each river basin, isolated by huge tracts of dense forest, has provided a niche for succulents to colonise and evolve their own characteristics independently.

In the late spring of 2008 my wife and I were able to search for succulents in the north of the state of California and the south of neighbouring Oregon for river basin endemics, and found three very interesting populations of gormanias (Fig. 1).

## The taxonomic status of *Gormania*

As *Crassulaceae* of the New World began to filter into botanic gardens in the early days of exploration, plants with tubed flowers were placed in the genus *Cotyledon*, so most of the species that we now call *Echeveria*, named before 1906, were then assigned to *Cotyledon*. Britton & Rose in their account for the *North American Flora* (1905) adopted De Candolle's name *Echeveria* (1828) for the New World rosette-forming *Crassulaceae* with tubular flowers, but distinguished *Dudleya* and *Gormania* (both 1903) for these plus other minor characteristics.



Fig. 1 Distribution map showing the three locations visited



Fig. 2 The Applegate River within 200m of a *Sedum oblancoelatum* location

Recent cytological and DNA evidence overwhelmingly supports the separation of *Echeveria* and *Dudleya*, while DNA sequencing suggests that *Gormania* is allied to *Dudleya* rather than to *Echeveria*. Like *Dudleya*, *Gormania* could be a relict group of species of the Pacific or Juan de Fuca plates rather than the American plate. However, several respected floras of North America have retained *Gormania* while European publications place species within the 'catch-all' genus *Sedum*.

This inclusion makes it impossible to define *Sedum* in a way that distinguishes it satisfactorily from other *Crassulaceae*, so this is likely to be revised in due course, but for the purposes of the present article this placement is provisionally adopted for convenience.

*Sedum oblancoelatum* Clausen (1976: 403–404). Applegate Stonecrop.

Discovered by R H Whittaker in the drainage basin of the Applegate River in 1950 on diorite outcrops (Fig. 2).

With the expert help of professional botanist Barbara Mumblo, I located this species on Tuesday, 20 May 2008 at an altitude of 457m, the lowest point of its range. Here the plants were in flower (Fig. 3), so we resisted attempting to move up to its upper limit of 1582m as roads at this level were still snow-covered and the plants, we surmised, would be in a less developed state.

Closely related to *Sedum laxum*, *S. oblancoelatum* is a striking species (Fig. 4), easily separated from other *Gormania*, and only found in a handful of sites, all in the Applegate Basin.

*Sedum moranii* Clausen (1942: 40). Rogue River Stonecrop.

Originally published as *Cotyledon glandulifera* L F Henderson (1930), and transferred to *Gormania* by the same author in 1941. However, under *Sedum* it clashes with another species with the same but earlier, priority name, so it had to be renamed by Clausen.

Again, without the phenomenal local knowledge of Barbara Mumblo, I would not have been able to locate this species, which is endemic to peridotitic rocks. (Peridotite is an ancient igneous rock believed to be the



Fig. 3 (above) *Sedum oblancoelatum* growing on a ledge of igneous rock

Fig. 4 (below) Each rosette of *Sedum oblancoelatum* is about 4cm across





Fig. 5 (above) The Rogue River gorge

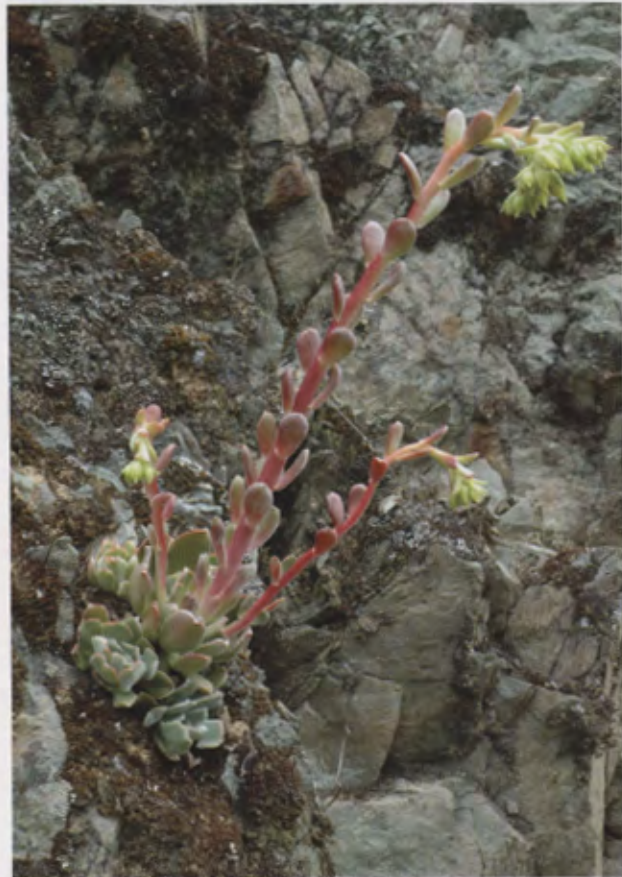


Fig. 6 (left) *Sedum moranii* on a west-facing cliff at the confluence of the Grave and Rogue rivers

Fig. 7 (below) Detail of *Sedum moranii* flowers showing the fine covering of the glandular indumentum



Fig. 8 *Sedum albomarginatum* at its type locality in the Feather River canyon

main constituent of the earth's mantle.) On Friday, 21 May 2008, we motored to the confluence of the Grave Creek and the Rogue River (Fig. 5). Assiduous searching was necessary to locate any plants at all, and I spent the best part of an hour moving to different sites in the steep gorge, training my binoculars onto vertical cliffs. This was made even more difficult by the large number of the common *Sedum spathulifolium* plants on the south-west bank, also pruinose, and mostly in flower at the time. I spotted a single specimen of *S. moranii* on the opposite bank on a vertical wall, only approachable by climbing steep scree that proved to be very loose. As with most rock crevice dwellers, once you spot one, you soon see others in similar positions. I did manage to get close enough to photograph specimens in full bloom (Fig. 6), displaying their red inflorescences and buttercup-yellow flowers and covered with the tiny glandular hairs that gave the plant its original name (Fig. 7).

*Sedum albomarginatum* Clausen (1976: 424–425). Feather River Stonecrop.

Actually this species was discovered by Charles H Uhl, but he was unscrupulously beaten to publication by Robert T Clausen. It is only to be found on the northern side of the East Branch of the North Fork of the Feather River and in the adjacent Caribou Creek, and is another denizen of serpentine rocks.

We found the type locality on Sunday, 25 May 2008, were able to photograph some specimens (Figs. 8–9), and then moved up the Caribou Road for further exploration. Oddly, here we found strong specimens



growing on north-facing sites at about 600m and several in talus (rock-fragment slope at the foot of a cliff) rather than in cracks in the serpentine cliffs. Another rare basin endemic succulent of a different family, *Lewisia cantelovii*, shared the site (Fig. 10).



Fig. 9 (above) Detail of an inflorescence of *Sedum albomarginatum* at the type locality



Fig. 10 (left) Two basin endemic succulents, *Sedum albomarginatum* and *Lewisia cantelovii*, sharing the same serpentine wall in Caribou Creek

We did encounter two other Gormania basin endemics on our travels and realise others exist but were beyond our reach. Perhaps on a future occasion we will manage to seek out some more but most occupy very remote areas.

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