

**Figures 64–70. *Villadia paniculata*.** **Figure 64.** *V. paniculata* *ex situ*. **Figure 65.** Detail of the branches and leaves. From left to right: mature branch, leaves, young shoot. **Figure 66.** Simple spike of *V. paniculata*. Note the showy greenish white flowers similar to those of *S. isidorum*. **Figure 67.** Panicle of *V. paniculata* starting to bloom. **Figure 68.** Detail of the flowers. From left to right: (above) geminate bud, geminate flower, single flower, flower section, gynoecium; (below) bracts (5), sepals (3), petal (outer, lateral, and inner view). **Figure 69.** *V. paniculata* in habitat on the road from Alisopata to Nueva Esperanza. **Figure 70.** Spike of *V. paniculata* before anthesis.

*Villadia thiedeii* is taller, more branched, the leaves are longer and narrowly subdeltoid. It has the lightest-colored leaves of any species in Department Cajamarca, although very exposed plants may have reddish stems (Fig 63). Its flowers, with yellow petals and carpels, are very difficult to discern and are perhaps the smallest of any Peruvian species. Petals of *V. virgata* are whit-

ish, slightly recurved at the apex, and the outer side has a brownish keel. The new species has coriaceous petals with incurved apices and with a pinkish tinge on the outer side of the apex. The species is dedicated to the German botanist Joachim Thiede, an authority on Crassulaceae, who together with Henk 't Hart transferred all cymose Peruvian Sedoideae to *Sedum* (1999). He kindly forwarded to us all his papers and photos to make this article possible. Although his name is pronounced "tee-duh" in German, I suggest the specific name be pronounced "TEE-dee-eye" for the sake of euphonics.

# 10. *Villadia paniculata* PINO & CIEZA sp. nov.

*Planta succulenta glabra florens usque ad 25 cm alta. Caulis procumbens, 2–4 mm diam, ferrugineus. Rami 1–5 erecti, steriles 4–12 cm longi, florigeri usque ad 25 cm longi, caulibus ad basin 1.8–2 mm diam rubiginosis. Folia succulenta, spiraliter disposita sessilia congesta ubi juvenia, anguste oblonga vel subteretia 8–14 mm longa, 1.5–1.8 mm lata, subacuta, flavovirentia apicem versus rubescentia. Inflorescentia terminalis spica 3–8 cm longa, 5–20 floribus sessilibus, vel plerumque paniculata usque ad 9 ramis spicatis 6–9 floribus terminalibus. Bracteae in quoque ramo basales et inter ramos, foliorum similes sed calcari instructae et sursum planae. Bracteolae ovatae-triangulares 5.5–6.5 mm longae 1.4–1.7 mm latae. Sepala anguste oblonga vel subteretia ad basin dealbata curvata 6.5–8 mm longa 1.4–1.6 mm lata. Petala oblonga 7–7.8 mm longa, 2–2.5 mm lata, albovirentia, a basi usque ad tertiam partem coalita, demum deltoidea a dimidia parte extrorsum leviter recurvata. Stamina filamentis albis. Carpela 5 fusiformia albovirentia. Floret ab Aprile ad Majum.*

**Holotype:** Dept. Cajamarca, Prov. San Marcos, Dist. José Sabogal, road from Alisopata to Nueva Esperanza, among shrubs along the road, with *Oxalis* sp, *Piper* sp, *Peperomia cymbifolia* var *goodspeedii*, *P. nivalis*, 7°18'36" S, 77°59'41" W, 3028 m, 23 Aug 2002, RRP 321 (G. Pino 1075) (USM 224,792).

A succulent glabrous herb, 12–25 cm tall when flowering (Fig 64). Roots filiform, 2–4 cm long, 0.2 mm diam, brownish. Stem procumbent, subterranean, 2–4 mm diam at base, reddish-brown, branching every 1.5–7 cm. Branches 1–5, erect, vegetative shoots 4–12 cm long, flowering shoots up to 25 cm long, rachis 1.5–3 mm diam at base, reddish-brown at base to reddish-green at apex. Leaves sessile, succulent, spirally arranged, crowded on young shoots, attached at a right to acute

angle, straight to very slightly upcurved, narrowly oblong to subterete, 8–14 mm long, 1.5–1.8 mm wide, 1–1.3 mm thick, obtuse-subacute, upper and lower sides convex, light yellowish-green, reddish at the apex, margins entire (Fig 65).

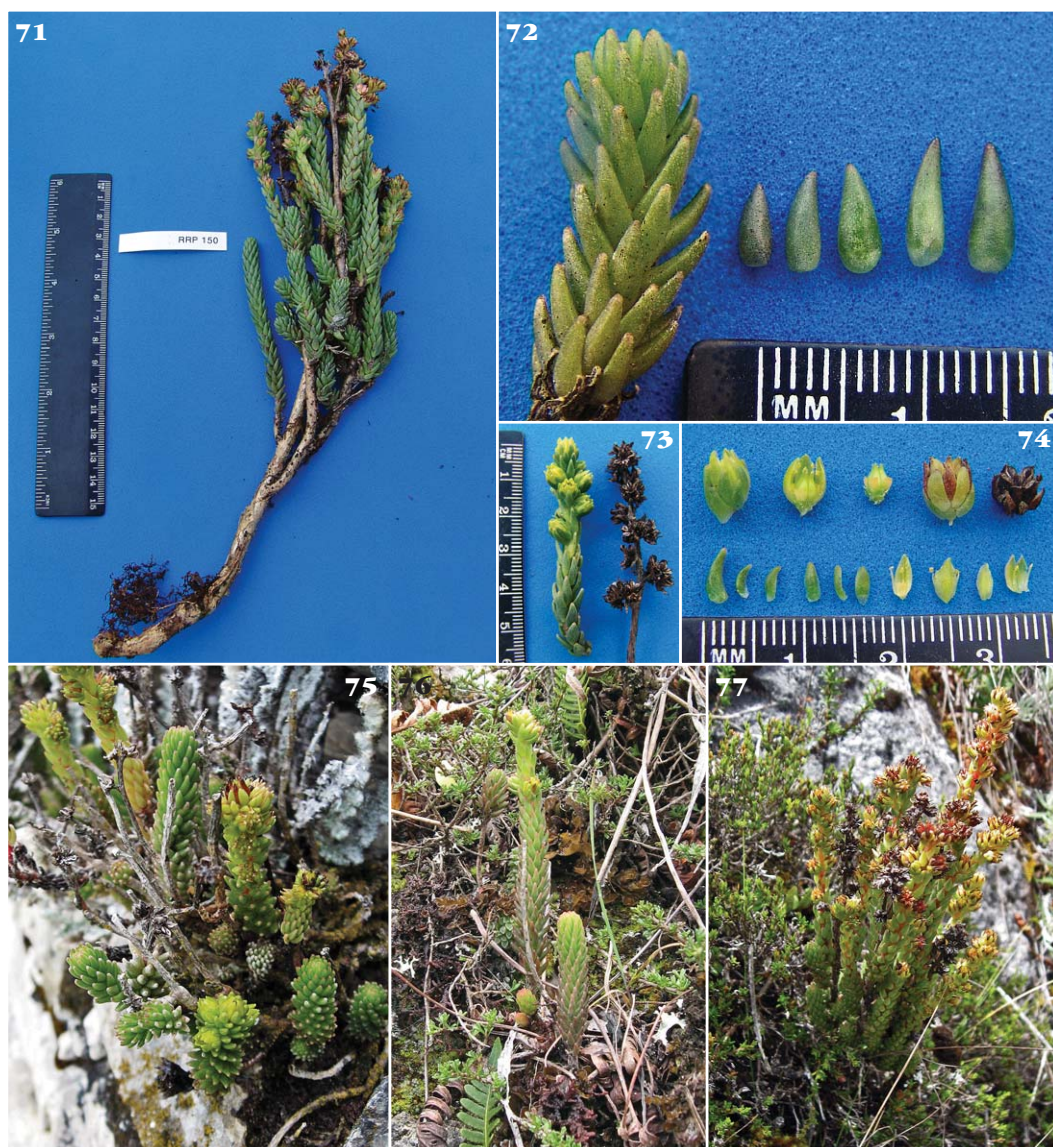
Inflorescence a terminal single spike 3–8 cm long, rachis 1.2–2 mm diam, with 5–20 crowded flowers (Fig 66) or a panicle with up to nine branches (spikes), each with (3–) 6–9 flowers crowded at the tips, rachis 0.5–3 cm long, 1.1–1.5 mm diam, light reddish-green to bright red, bracts at the base of each branch and between them, like the leaves but flat above and hyaline-spurred (Fig 67). Flower buds 6–8 × 4 mm, frequently geminate, appearing from April to May. Bracteoles two per flower, 5.5–6.5 mm long, 1.4–1.7 mm wide, narrowly ovate-deltoid, obtuse to acute, upper side flat-concave, lower side convex, with a hyaline spur at base. Pedicels very short. Sepals narrowly oblong to subterete, curved at the whitish base, 6.5–8 mm long, 1.4–1.6 mm wide, light yellowish-green. Petals oblong, obtuse-acute-deltoid at tip, united along the proximal third, outcurved along the distal half, 7–7.8 mm long, 2–2.5 mm wide, outer surface keeled, pale greenish-white at center and tip, inner surface concave, white, margins entire. Stamens ten, the five epipetalous 3.5–4 mm long, the antesealous 4.5–5 mm long, filaments white, conical, 0.6–0.8 mm diam. Anthers ovoid, 6–8 mm long, yellow. Gynoecium ovoid, 2.5 × 3.5–4 mm, greenish-white. Carpels five. Styles 2.2–2.5 mm long, conical, greenish. Nectary scales reniform, 0.8 × 0.6 mm, greenish white (Fig 68). Fruit not seen.

In December 2000, Alfred Lau visited Peru and attempted unsuccessfully to locate the type locality of *Matucana huagalensis* (DONALD & LAU) BREGMAN, discovered by him in 1968. Two years later Olivier Klopfenstein and Nelson Cieza found the exact locality at Nueva Esperanza, and on the way they collected a few specimens of an unidentified species of *Villadia* (Fig 69). Plants were cultivated at the Botanical Garden of San Marcos, where it became clear that this was a new species, its most striking character being the terminal inflorescence with lateral, alternate branches along the main central axis, forming a panicle of spikes (Fig 70), which in old plants resembles a raceme without bracts. Flowers are showy, petals are greenish white, with apices folded outwards but not as curved or golden yellow as in *Villadia aureistella*. When Klopfenstein and Cieza returned later, they



reported seeing plants with whitish and yellow flowers. It is likely that they saw *V. aureistella*, which may also grow there. These two species can be easily be mistaken for one other because of similar foliage, even though *V. paniculata* has straighter leaves. We visited this locality recently and found very few plants due to the building of new roads. We

hope this species will prove to have a wider distribution in the province of San Marcos to the north, and perhaps in the province of Celendín, for it has never been found further south. The name “paniculata” refers to the inflorescence, uncommon in the genus. Simple spikes can also be observed in small, weak plants.



**Figures 71–77. *Villadia kinnachii*.** **Figure 71.** *V. kinnachii* in habitat. **Figure 72.** Detail of the young shoot (left) and leaves (right). **Figure 73.** Comparison of spike with flowers (left) and mature dry spike (right). **Figure 74.** Detail of the flowers. From left to right: (above) flower, flower section, gynoecium with nectaries, immature fruit, dry fruit; (below) bracts (3), sepals (3), petal (inner, outer, and lateral view). Note the remarkable salmon-colored nectaries. **Figure 75.** *V. kinnachii* in habitat at Casablanca initiating anthesis. **Figure 76.** Young *V. kinnachii* with lycopodium-like growth. **Figure 77.** Mature *V. kinnachii* with mature spikes. Figures 17, 19, 20 by Sidney Novoa; Figures 33, 34, 35, 42, 46, 48, 49, 50, 56, 61, 63, 69, 70, 75, 76, 77 by Nelson Cieza; all others by Guillermo Pino.