

Govenia praecox Salazar et Greenwood, *sp. nov.*
(Figs. 1-3).

Cormi ovoidei; vagine angustae, in sectione transversali subquadratae; folia duo, per anthesin immatura; racemus pedunculatus, floribus succesivis, breviter cylindricus, sed ob numerum recutum florum simul apertorum ut videtur subcapitatus; flores parvi, flavi; sepala

ex rubro suffusa; petala subtiliter rubro fasciata, labello albo vel pallide luteo maculis brunneis.

Plant terrestrial, up to 65 cm high. **Roots** arising from the base of the corm, round in cross section, simple, pilose, white, to ca. 10 cm long, 1.5–2.5 mm diameter. **Corm** obliquely ovoid to subglobose, visibly 4-noded (other nodes are hardly evident because of being very close together), whitish or green (when exposed to light), when mature devoid of sheaths or only with fibrous remainders of sheaths, ca. 5 cm long, 4 cm wide. **Sheaths** 3–4, from the lowest nodes of the corm, alternate, tubular, concentric, laterally compressed and subquadrate in cross-section, successively longer upwards, the inner longest, up to ca. 26 cm long, 2 cm diameter; apex broadly obtuse-rounded, margins entire, many-veined, with the line of fusion of the margins forming a prominent, rounded keel at one corner, the other corner keels smaller; outer surface slightly irregular, dull lustrous, finely colliculate, the cells in longitudinal rows; colour a dark reddish suffusion and veins (paler upwards) on a translucent, whitish ground, becoming yellow-brown with irregular pale red areas; although not particularly strong, the tubular sheaths give mechanical support to the leaves, whose petioles cannot stand by themselves if the sheaths are cut away. **Leaves** 2, petiolate, articulate, blades deciduous only after the new growth is half-grown (ca. 2 weeks before flowering), the new ones not fully expanded at flowering time; petioles from the uppermost nodes of the corm, tubular, concentric, quadrate in cross section, three of the angles are continuous with the three main veins of the leaf and are very sharp and prominent, the fourth angle (continuous with the line of fusion of the blade margins) is rounded and not prominent; completely concealed by the sheaths, light green, weak, 7–8 cm long; expanded blades ascending-arcuate, plicate, elliptic, light green, iridescent under strong light, to ca. 43 cm long from the juncture of the petiole to the apex, (7) 10–12 cm wide at the widest part of the blade; base tapering into the petiole and articulate with it, channeled, conspicuously three-angled dorsally; margins entire to obscurely undulate, the extreme mar-

gin somewhat deflexed; apex sharply acuminate. **Peduncle** from an upper internode of the corm, between the inner sheath and the outer petiole, erect, stiff, round, 35–65 cm long including the inflorescence, 3.5–5.5 mm diameter at the middle; surface lustrous, nearly smooth, minutely colliculate, the cells elongate, in longitudinal rows; dark red, paler upwards and near the base (pale green); with a narrow, tubular, scarious-membranous, brown bract 17–25 mm long. **Inflorescence** an erect, cylindrical raceme of about 10–40 flowers opening in succession from below; buds white, turning yellow shortly before anthesis; unpollinated flowers soon falling and the rachis continuing to elongate in the zone of open flowers, the open flowers and buds forming a rather dense, almost subcapitate cluster to ca. 4–5 cm long; raceme 6–18 cm total length, ca. 4 cm diameter, with the flowers ascending at 30°–45°; rachis 4.5–9 cm long, 3 mm diameter, not round, the surface formed of low, wide keels subtending the flowers and long-decurrent downwards; surface lustrous, minutely colliculate, the cells in longitudinal rows; light green, sometimes suffused dark red. **Floral bracts** sessile, about half as long as the ovary and lying close to it, shrivelling during flowering, persistent after the flowers fall, then projecting more or less at 90° to the rachis axis; when flattened, sublanceolate, the base wide, apex long-tapering, acute, 6.5–14 mm long, 2.5–3 mm wide below the middle; margins entire, 3-veined; when fresh, lustrous, almost white, red-brown-flushed along the axial zone, when dried scarious-membranous, brown; finely colliculate, the cells in longitudinal rows. **Flowers** ascending at ca. 30°–45° to the rachis axis, small for the genus, ca. 1.5–2.5 cm high across the perianth apex (with noticeable variation between uppermost and lowermost flowers of the same inflorescence), 2–2.5 cm long including the ovary; showy, yellow flushed with red; diurnal odour soft, fresh, agreeable. **Ovary** obscurely pedicellate, ascending at 45°–60°, straight to slightly arcuate, nearly cylindrical, (10.5) 12–17.5 mm long, 1.2–2 mm diameter, hardly dilated at the 30° oblique apex; surface formed by 3 flattened keels and 3 almost equal interstices, these straight in the apical half, below

smoothly twisted ca. 90°; surfaces lustrous, minutely colliculate, the cells in longitudinal rows; light green, sometimes suffused dark red, fading to almost white. **Dorsal sepal** arising at almost 90° to the ovary axis, smoothly arcuate ca. 90° over the column, forming a hood with the petals; transversely slightly concave near the middle, flat at base and apex; when flattened, oblanceolate-spatulate, apex broadly rounded, (11.3) 12.5–18 mm long, (3) 4.7–6 mm wide well above the middle; margins entire, thin; 5-veined; surfaces lustrous, finely colliculate, cells in longitudinal rows; yellow, red-flushed in a broad axial zone. **Lateral sepals** arising from the lower margin of the column foot, projecting forward at 40°–60° from the column axis; subelliptical, falcate ca. 45°, the apices close together, but not overlapping, apex sharply obtuse, base narrow, ca. half as wide as the middle; (6.7) 8.5–11.5 mm long across the curve, (3) 4.0–4.8 mm wide at the middle, usually twisted slightly inwards; margins entire; 5-veined; surfaces lustrous, finely colliculate, the cells in longitudinal rows; bright yellow flushed red almost full length along the axial zone, covering a half or more of the total area, sometimes slightly asymmetrically. **Petals** arising from the lateral margins of the column foot, arcuate under the dorsal sepal and twisted inwards to place the apical half flatly transversely under the dorsal and close to it to form a loose hood; the adjacent margins of the petals overlap heavily from near the base to above the middle; when flattened, subovate, subacute to obtuse, falcate ca. 45°, mostly above the middle, adjacent margins smoothly curved, outer margins markedly sinuate, with shallow, rounded re-entrants at about 1/3 and 2/3 the total length; (9.5) 10–13.3 mm long, (4) 5.2–6.5 mm wide above the middle; margins entire, slightly irregular near the apex; 5-veined (veins branched above the middle); surfaces lustrous, finely colliculate, cells in longitudinal rows along a wide axial zone, fanning towards the inner (adjacent) margins from just above the base to beyond the middle; light yellow, inner surface from just above the middle almost to the apex densely barred with wide, somewhat irregular orange-red lines. **Lip** from a short, narrow, flexible claw at the base of the column

foot, versatile, the first 1/3 nearly straight and parallel to the basal column axis, then smoothly but shortly decurved to lie at an angle of ca. 45°–60° away from the apical axis of the column; the extreme apex abruptly decurved-revolute to 90° or more; transversely wide V-concave nearly to the apex, with a wide, shallow, rounded groove along the axis; when flattened (always with some distortion) broadly ovate, subacute, often with a minute mucro forming the extreme apex, the base flatly rounded to subcordate, 5.5–6 mm long, (3.5) 4–4.5 mm wide; 5-veined at the base, the outermost veins much branched; inner (adaxial) face pale brown from the base to 3/4 the total length, apical 1/4 pale yellow, with 3–5 sharp-margined, dark warm brown, subelliptical spots along the subapical margins, and just above the middle a pair of larger, indefinite-margined spots inside the main brown area, and often more or less blended with the brown background, fading into it basally; outer (abaxial) face white, with one indefinite-margined pale brown spot at each side of the base. **Column** arising from the 45° oblique apex of the ovary at 90° to the ovary axis, then smoothly arcuate ca. 45°, transversely rounded dorsally, with 3 long, low, wide, V-shaped longitudinal ridges full length from the bases of the sepals to the apical margin; ventral side deeply rounded, canaliculate full length, the lateral margins above the middle forming a pair of vertical, wide, round-margined wings about half as long as the column, terminating towards the apex of the column in an acute, shortly triangular tooth (exceptionally absent); column (5) 5.5–6.5 mm long across the arc, 2.0–2.7 mm wide across the wings; dorsal surface lustrous, minutely colliculate, the cells in longitudinal rows fanning out towards the apical and wing margins; ventral surface similar; pure white externally, with a few pale reddish spots on the face of the column foot; internally white, with a few faint, reddish, irregular transverse bars from below the stigma nearly to the column foot, the foot with a few darker bars and reddish and bright yellow spots; column foot deeply channeled, the thick walls of the channel continuous with the sharp sides of the column which above become the wings; 2–3 mm long,

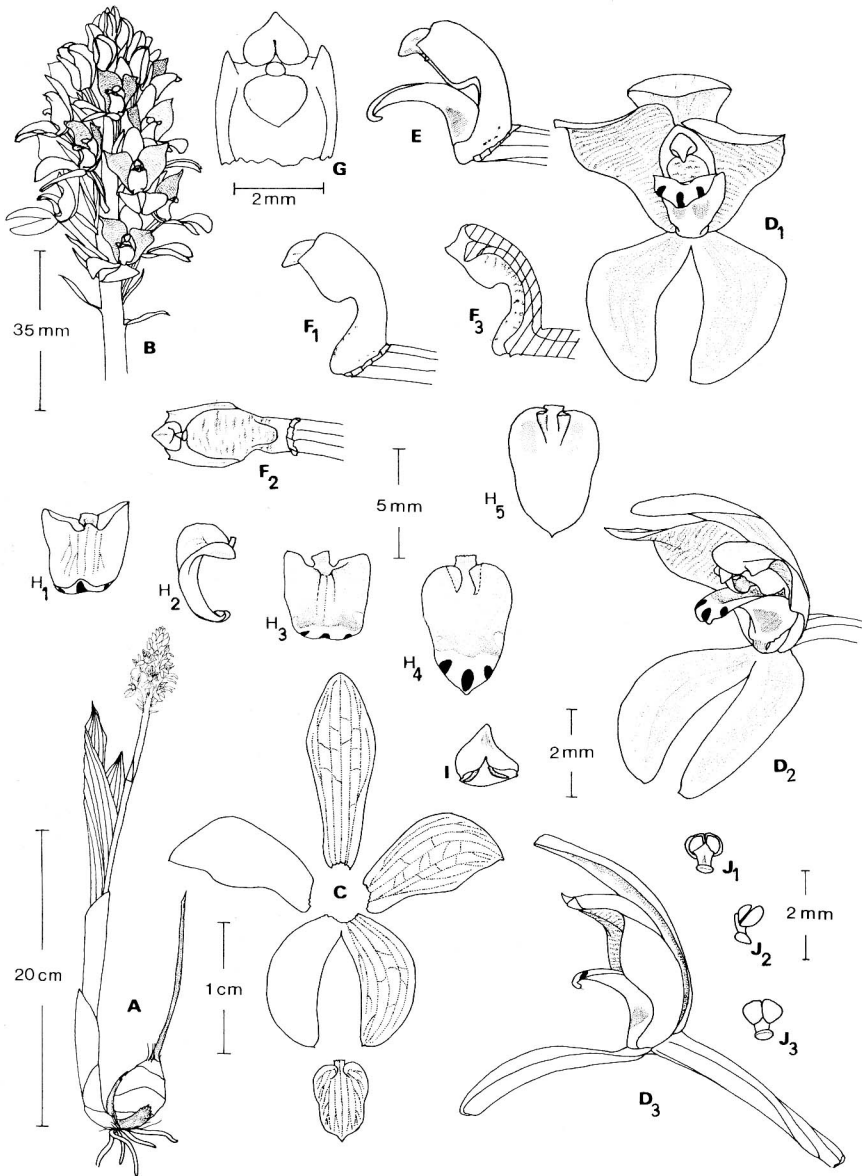


Fig. 1. **GOVENIA PRAECOX**. A, habit. B, close-up of inflorescence. C, flower dissection. D, views of a flower: (1) front, (2) 3/4 side, and (3) side. E, column and lip, side view. F, views of a column: (1) from one side, (2) from below, and (3), longitudinal section. G, apex of column from below showing stigmatic surface. H, views of lip: (1) from below, (2) from one side, (3) from above, (4) flattened, from above, and (5) flattened, from below. I, anther, from below. J, pollinarium: (1) dorsal view, (2) lateral view, and (3) ventral view. Drawing by G.A. Salazar based on the type plant.

ca. 2 mm wide. **Clinandrium** the slightly convex, truncate, apical surface of the column apex lying inside a wide, shallow, semicircular, subperipheral groove which fits the margin of the anther cap; the groove's outer margin being the apical column margin; 3-toothed, the teeth the apices of the ridges of the dorsal column surface, the middle tooth almost obscure, the lateral ones very thick and fleshy, the ventral margin sharp, forming the **rostellum**, with a central notch containing the viscidium; surface lustrous, minutely random colliculate, white. **Anther** very prominent, subconical, the dorsal surface a rather sharp axial ridge downcurved to the beak-like apex; lower surface almost flat transversely, bilobed, with a narrow basal sinus extending forward as a short crevice; ca. 1.2 mm long, 1 mm wide, 0.8 mm high; one-celled, the cavity very deep; outer surface lustrous, finely colliculate; bright yellow. **Pollinarium** one, complex, made up of pollinia, caudicles, stipe, and viscidium; seated on the floor of the clinandrium with the pollinia projecting forwards, almost parallel to the column axis, and the viscidium projecting downwards, facing backwards across the stigmatic cavity. **Pollinia** 4, in two pairs side by side, in each pair the pollinia unequal, the larger ventral, the common faces parallel to the column axis; pollinia subellipsoidal, dorsiventrally somewhat compressed, adjacent faces nearly flat, in contact; ca. 0.7 x 0.5 x 0.3 mm; surfaces lustrous, appearing subcolliculate; bright yellow. **Caudicles** reduced to tiny, formless masses cementing the pollinia to the stipe. **Stipe** a thin, irregular mass of white tissue lying mostly between the bases of the pollinia pairs, extending downwards as a short, wide, thin sheet to join the viscidium, and nearly as wide as the two pairs of pollinia together. **Viscidium** a thick, rounded cushion formed at the centre of the rostellum, almost round, the free surface convex, soft, adhesive, white. **Stigmatic surface** wide subelliptical, slightly wider than long, the apical margin rounded, the base vaguely rounded obtuse, ca. 1.3 mm long, 2.0 mm wide; flatly concave, the stigma lobes obscure; covered with a thin layer of transparent, shining, viscous liquid; white. **Capsule** (dried) brown, pendulous, ellipsoid, dehiscent, shortly pedicellate, 35-40 mm long,

ca. 15 mm diameter.

HOLOTYPE: MEXICO: VERACRUZ: [Mun. Huiloapan:] Cerro San Cristóbal, al este de la ciudad de Orizaba, cima subsidiaria subiendo desde la cantera cercana a la desviación a Orizaba de la autopista Cd. Mendoza-Córdoba, 1350 m s.n.m.; selva mediana perennifolia, perturbada; terrestre, en suelo húmico profundo; colecta 5 marzo 1992; prensado de material cultivado 22 abril 1992; *G.A. Salazar 5071, J. Arguijo, J.L. Ruiz y G. Suazo* (AMO!).

OTHER SPECIMENS: MEXICO: VERACRUZ: Mts. north-east of Orizaba, near Santa Ana, 97°4'N, 18°53'W, 1300-1600 m alt., shady places in forest in leafmould, fls. golden yellow, dark cross marks on p[etals], 26 April 1932, *O. Nagel* [in *Östlund's collection*] 2841 (AMES! MO! US!). Mun. Coscomatepec: Barranca de Jamapa, de la junta hacia arriba en el cerro, bosque mesófilo de montaña [con] encino, algo perturbado, 1670 m, terrestre en suelo algo inclinado, húmedo, con humus, en sombra, flor amarilla, cápsula café, 20 junio 1991, *F.G. Hernández 126* (CORU!). [Mun. Huiloapan:] Cerro San Cristóbal, a la altura del trébol a Orizaba de la autopista México-Córdoba; bosque mesófilo de montaña, terrestre, suelo arcilloso con mucha material orgánica, 1360 m s.n.m., 20 abril 1992; *J.C. Arguijo 130* (CORU!), *131* (XAL!), *132* (AMO!) and *133* (MEXU!). Cerro San Cristóbal, al este de la ciudad de Orizaba, cima subsidiaria subiendo desde la cantera cercana a la desviación a Orizaba de la autopista Cd. Mendoza-Córdoba, 1600 m s.n.m.; selva mediana perennifolia, perturbada; terrestre, en humus; colecta 10 julio 1991; prensado de material cultivado 11 junio 1992; *G.A. Salazar 4748, G. Bustos, J. Arguijo, C. Huerta y R. Gámez* (AMO!). Mun. Jilotepec: El Zacatal, cañada con bosque de encino, 1400 m, herbácea de 60 cm, flor amarilla con rayas cafés, 14 junio 1983; *F. Ventura 20291* (AMO!). The following specimens are from central Veracruz and bear short, subcapitate racemes with flowers successive, suggesting they belong in this species: Orizaba, *Meisner 167* (K!). Jalapa, fl. en abril, 1838, *J. Linden 17* (K!).

ETYMOLOGY: *Praecox*: from Latin precocious, developing early, in reference to the flowers being produced before the leaves mature.

DISTRIBUTION: Known at present only from central Veracruz. Further exploration is needed to determine if the species occurs in other areas, although its virtual absence in herbarium collections from elsewhere suggests that its geographical distribution may be restricted to the above mentioned area.

ECOLOGY: Terrestrial, in rich organic, sometimes clayey, soil, in somewhat disturbed places within the mountain rainforest and humid oak forest in ravines, from 1300 to about 1700 m altitude. In the Cerro San Cristóbal the plants were found forming loose colonies of up to some 25 individuals, but often much fewer. Flowering plants have been found associated with gaps or near the forest edge, it being apparent that flowering is positively influenced by high levels of light. Plants growing under dense tree cover are usually sterile.

PHENOLOGY: *Govenia praecox* bears green leaves throughout the year, the old ones (i.e., those developed during the previous growth season) are shed only after the new shoot is actively growing and the new leaves start to appear. Flowering occurs at a very early stage of development of the shoot, while the leaves are not yet expanded. Flowering starts in the wild in early April and by the end of that month most of the plants (at least in the Cerro San Cristóbal population) have finished their flowering, although specimens from other areas (e.g., Hernández 126 and Ventura 20291) were found in the wild in very late flowering in mid-June. Apart from the raceme with a few old flowers, the specimen Hernández 126 bears a single capsule on the scape produced in the previous year. In cultivation flowering has occurred from late March to mid-June.

RECOGNITION: *Govenia praecox* can be distinguished from its relatives by its early flowering, i.e., the inflorescence appearing from the very early new growth and the flowers opening before the leaves are fully expanded,

the short, cylindrical raceme of a few successively opening flowers often appearing subcapitate, and the small yellow flowers with sepals flushed and petals barred with red.

Specimens of *G. praecox* from near Orizaba (e.g., Nagel sub Östlund 2841) have been identified as *G. lagenophora* Lindley (Dressler 1965). Dressler (1965) noticed some distinctive features in the above collection, as the lower altitude and the less prominent axial ridge of the anther, but otherwise he regarded it as clearly belonging in *G. lagenophora*. However, Dressler's (1965) concept of *G. lagenophora* included at least three different taxa, as the plant illustrated there as *G. lagenophora* (fig. 7), collected in the state of Mexico (Dressler 2478, US!) does not belong in either *G. lagenophora* or *G. praecox*, but represents a further new species, *G. dressleri*-*ana* Greenwood (Greenwood 1993).

Both the original description of *G. lagenophora* (Lindley 1839) and material identified by Lindley as *G. lagenophora* (e.g., "Hort. Mexico, 1840", K-L!; apparently no specimen was preserved from the type plant, but this specimen, annotated in Lindley's hand, is probably the best candidate for purposes of typification), show that in this species the inner sheath enclosing the corm and the petioles of the leaves is characteristically inflated and round in cross-section ("*vagina lagenaeformi utriculata*") and the inflorescence is very much elongate ("*racemo longissimo multifloro*"), thus differing noticeably from the narrow, subquadrate sheaths and subcapitate racemes of *G. praecox*. Further, *G. lagenophora* has green sepals and petals variously suffused with purplish-brown, without definite transverse bars on the petals, which are proportionately much narrower than in *G. praecox*.

A plant from Xalapa, Veracruz figured by Loddiges (1831) as *G. superba* is very similar to *G. praecox* in having an ovoid-globose corm, early flowering and similar inflorescence and flower colour in general, but the petals were depicted as spotted instead of barred. From previous experience with other species of *Govenia* we believe that the pattern of coloration of the flowers is specifically

constant, thus being a reliable taxonomic character (cf. Greenwood, 1992a and 1992b). Because of such differences we prefer not to include Loddiges' plant as member of *G. praecox* although it is evidently closely related.

Two other species of *Govenia* have been recorded from the same areas as *G. praecox* without evidence of hybridization or introgression. *Govenia superba*, a widespread species which prefers somewhat colder and drier habitats, has been found on the same slope of the Cerro San Cristóbal as *G. praecox* but at altitudes of 1800–1900 m, in pine-oak forest, and the same situation appears to occur in the Barranca de Jamapa (J.C. Arguijo, pers. comm. 1992). *Govenia superba* differs from *G. praecox* in the larger flowers basically greenish-yellow, taller plants (to about 1 m or more) with long cylindrical racemes where most of the flowers are open simultaneously, and two large leaves which are fully developed and expanded at flowering time. *Govenia mutica*, on the other hand, can be found apparently in the same habitat as *G. praecox*, but it flowers at a different time of the year (September) and can be separated from the new species by the small white flowers with recurved tepal apices, purplish-brown marginal markings on the lip, the proportionately long-pedunculate raceme and the large leaves fully expanded at flowering time.

The specimen *Ventura 20291* differs from other samples of *G. praecox* in having flowers somewhat smaller, lacking (or at least not evidently showing) the apical triangular teeth of the column wings, and being in (very late) flowering by the middle of June. The leaves are comparatively in a more advanced stage of development, a feature shared with the specimen found in late flowering at the Barranca de Jamapa (*Hernández 126*). In other respects, however, these two collections correspond well with the type.

CONSERVATION STATUS: Rare. Thus far, *G. praecox* is known only from six localities. The population found at the Cerro San Cristóbal (on the slope facing the city of

Orizaba) occupies an area of probably no more than a few hundred hectares, although plant density appears to be relatively high. However, pressure from clearing for agriculture and charcoal production is a real, present threat to this population. The Cerro San Cristóbal, on the other hand, supports a diverse flora which includes about 50 orchid species (Salazar, unpublished), among them an interesting population of *Psilochilus*, a genus previously unrecorded from Veracruz. No data are available concerning the status of the *Govenia praecox* populations in the other known localities.