

Fig. 1. **A:** *Pinus chiapensis* (Martínez) Andresen – NE of Teziutlán, NE Puebla, Mexico; alt. 1650 m; coll. J. P. Perry, Jr., Jan. 1983. **B, C:** *P. strobus* L. – Watchung Reserv., Union Co., New Jersey, USA; coll. M. Kučera, Sept. 1998.

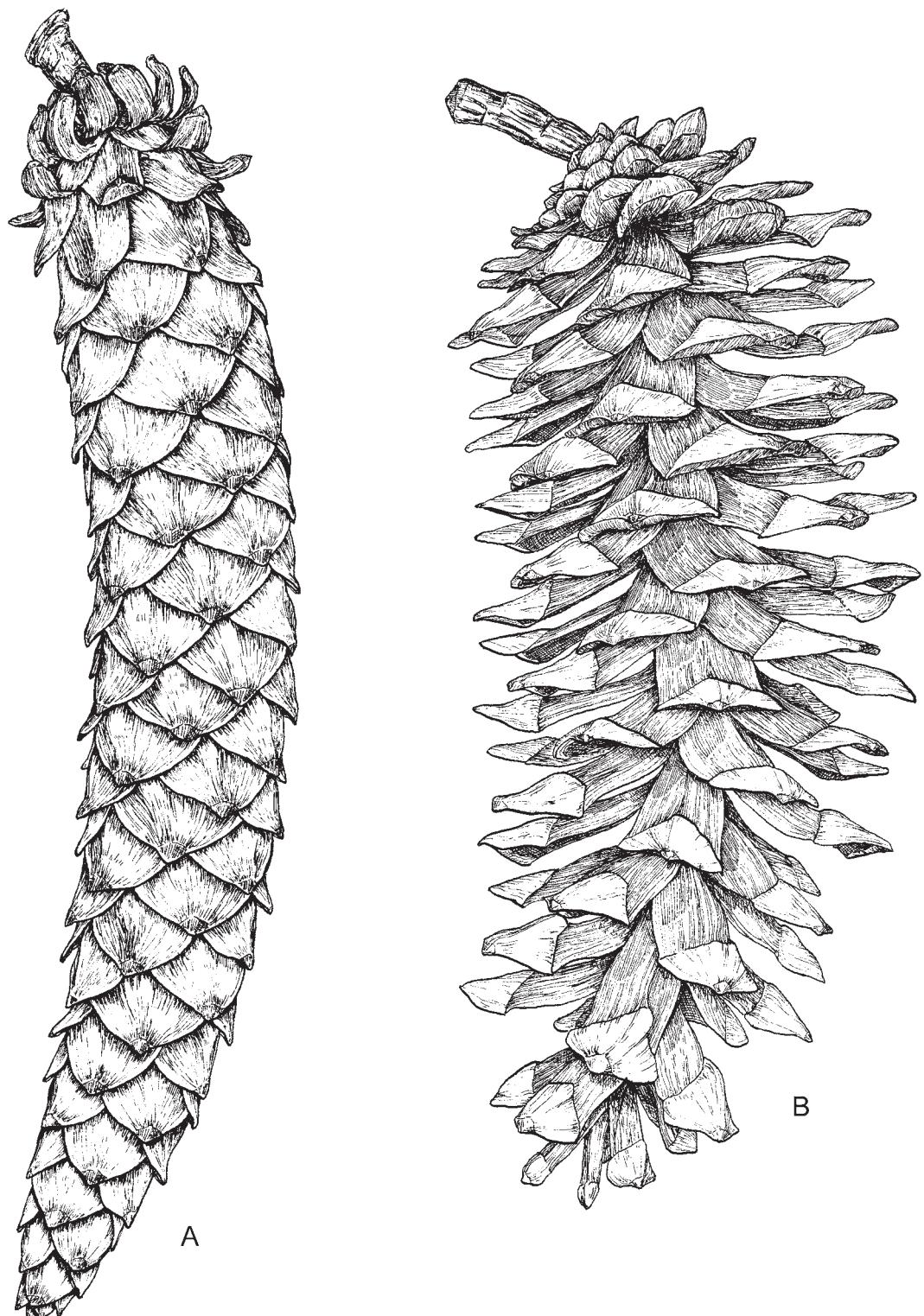


Fig. 2. *Pinus monticola* Douglas ex D. Don – **A:** Columbia Mts., British Columbia, Canada; coll. R. S. Hunt.; **B:** Mt. Elephants Back S of Carson Pass, Alpine Co., California, USA; alt. 2700 m; coll. Jan Weger, Oct. 1995.

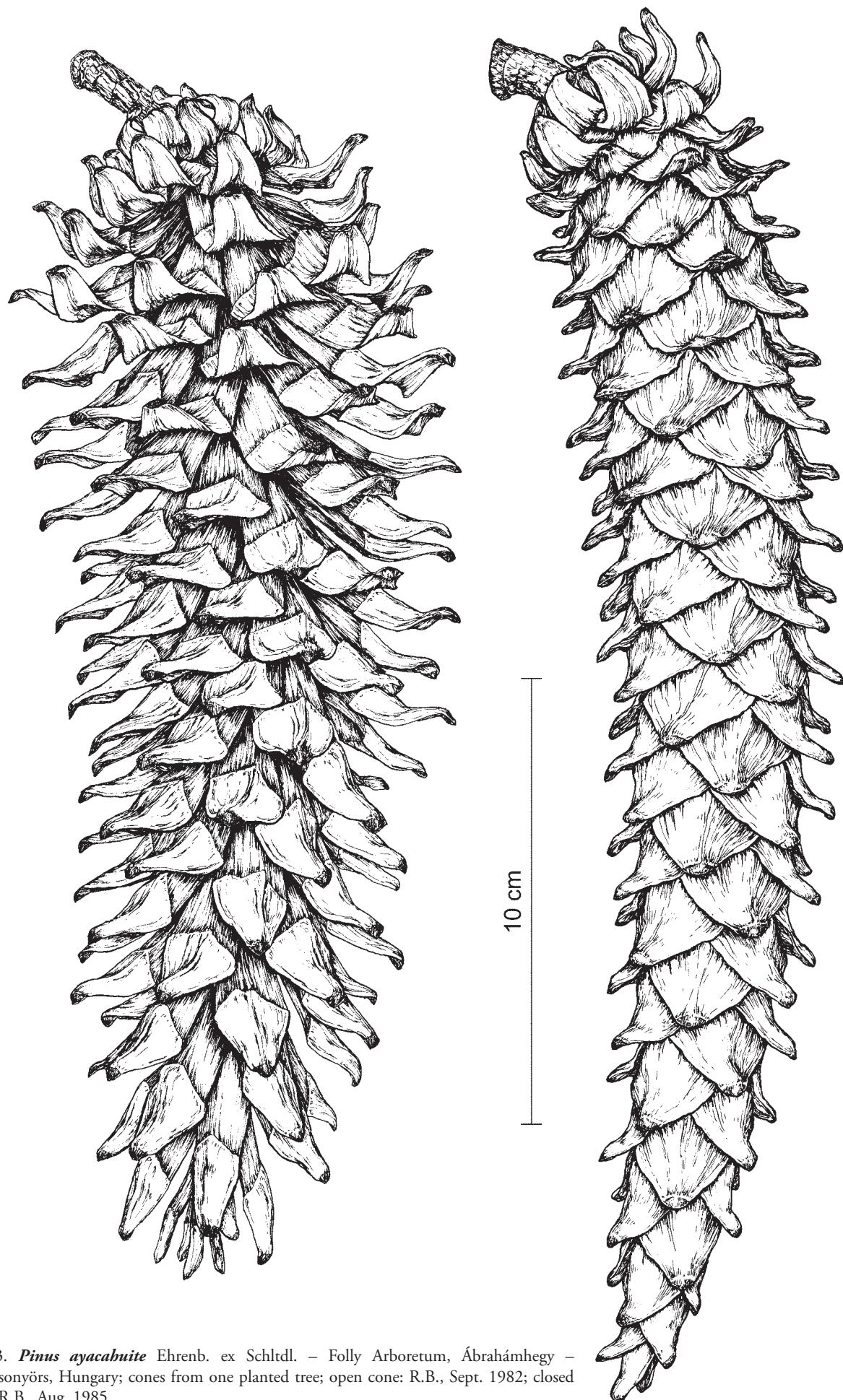


Fig. 3. *Pinus ayacahuite* Ehrenb. ex Schltdl. – Folly Arboretum, Ábrahámhegy – Badacsonyörs, Hungary; cones from one planted tree; open cone: R.B., Sept. 1982; closed cone: R.B., Aug. 1985.

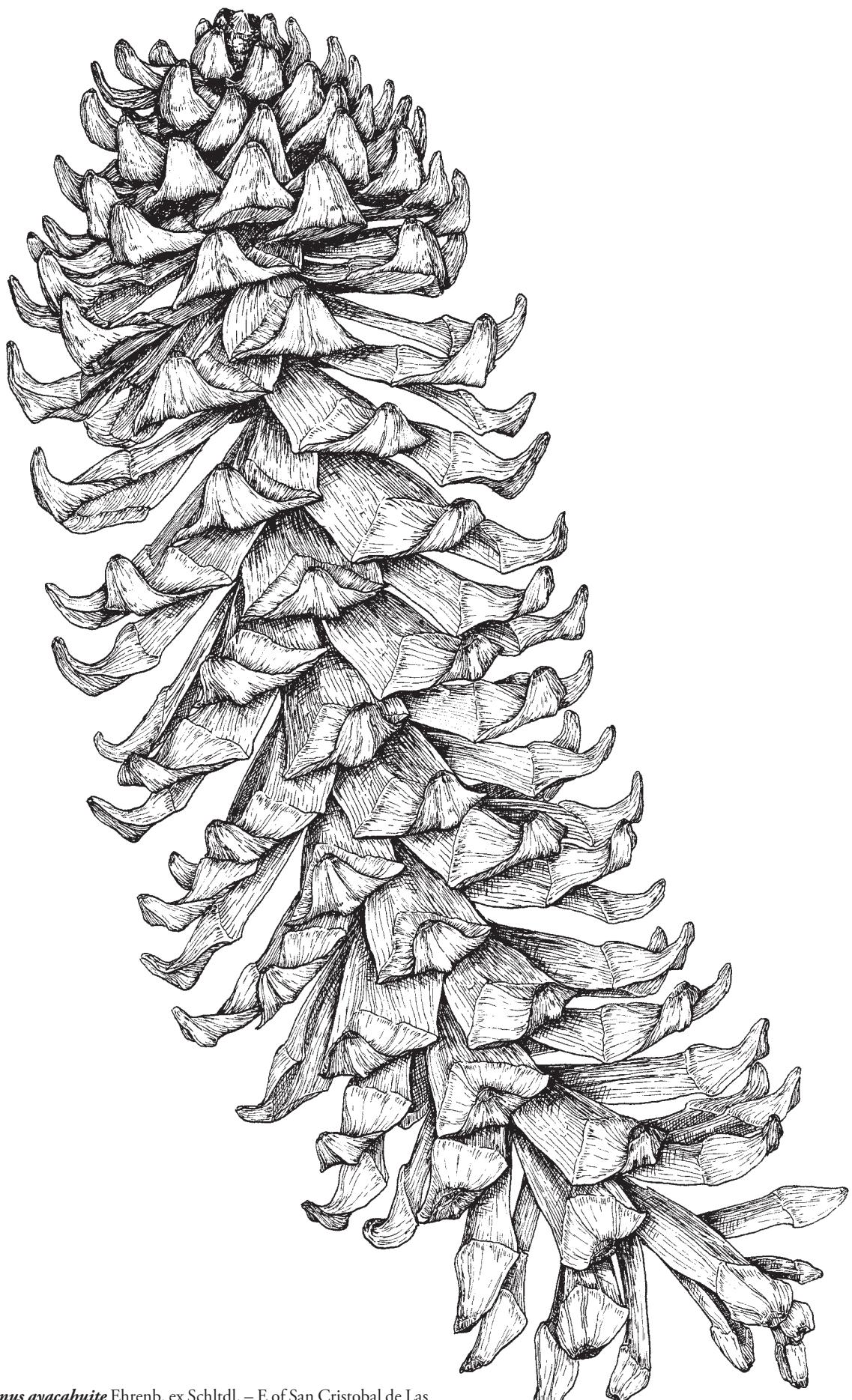


Fig. 4. *Pinus ayacahuite* Ehrenb. ex Schltdl. – E of San Cristobal de Las Casas, Chiapas, Mexico; alt. 2200 m; coll. J. P. Perry, Jr., Feb. 1983.

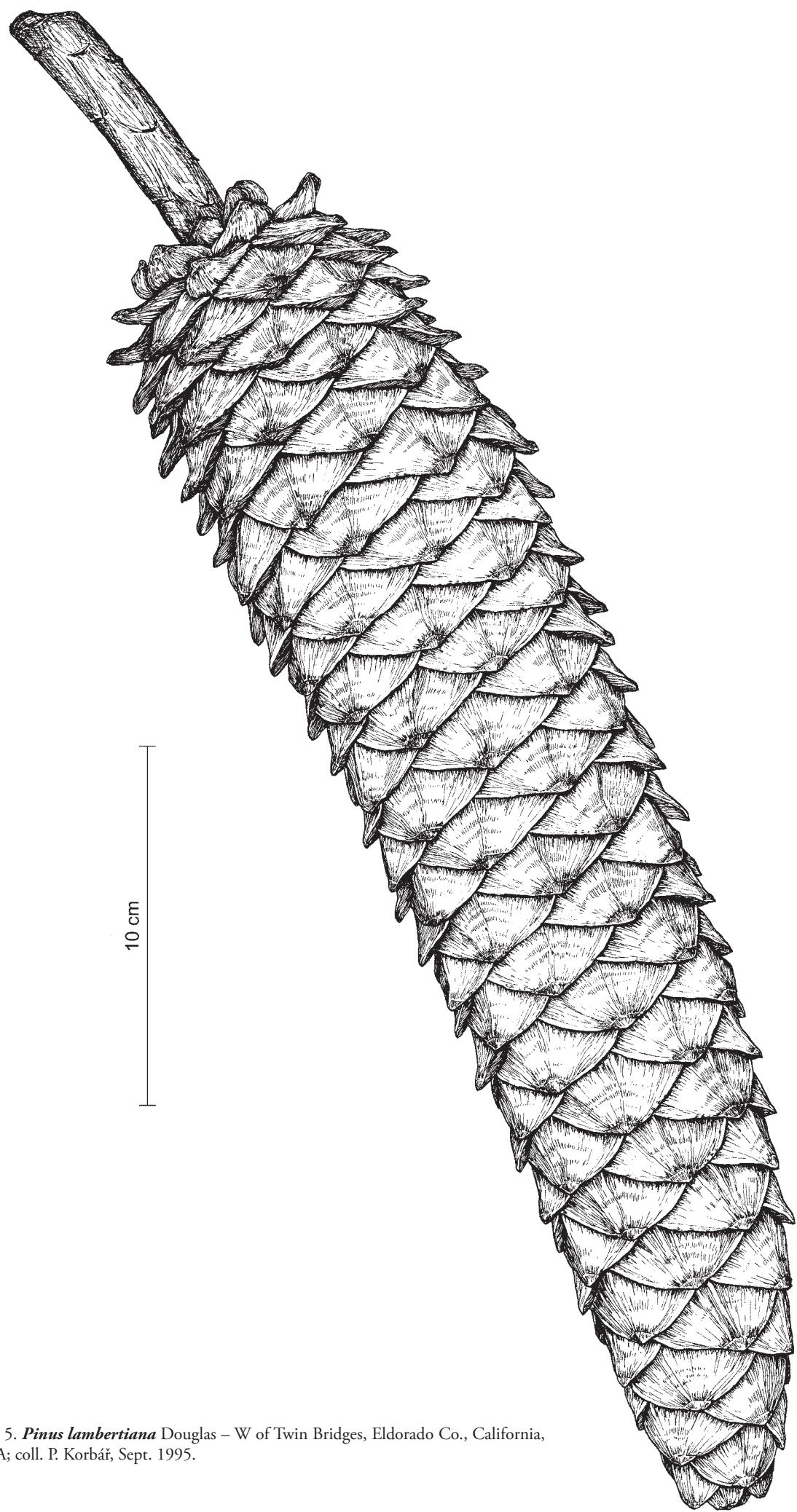


Fig. 5. *Pinus lambertiana* Douglas – W of Twin Bridges, Eldorado Co., California, USA; coll. P. Korbář, Sept. 1995.

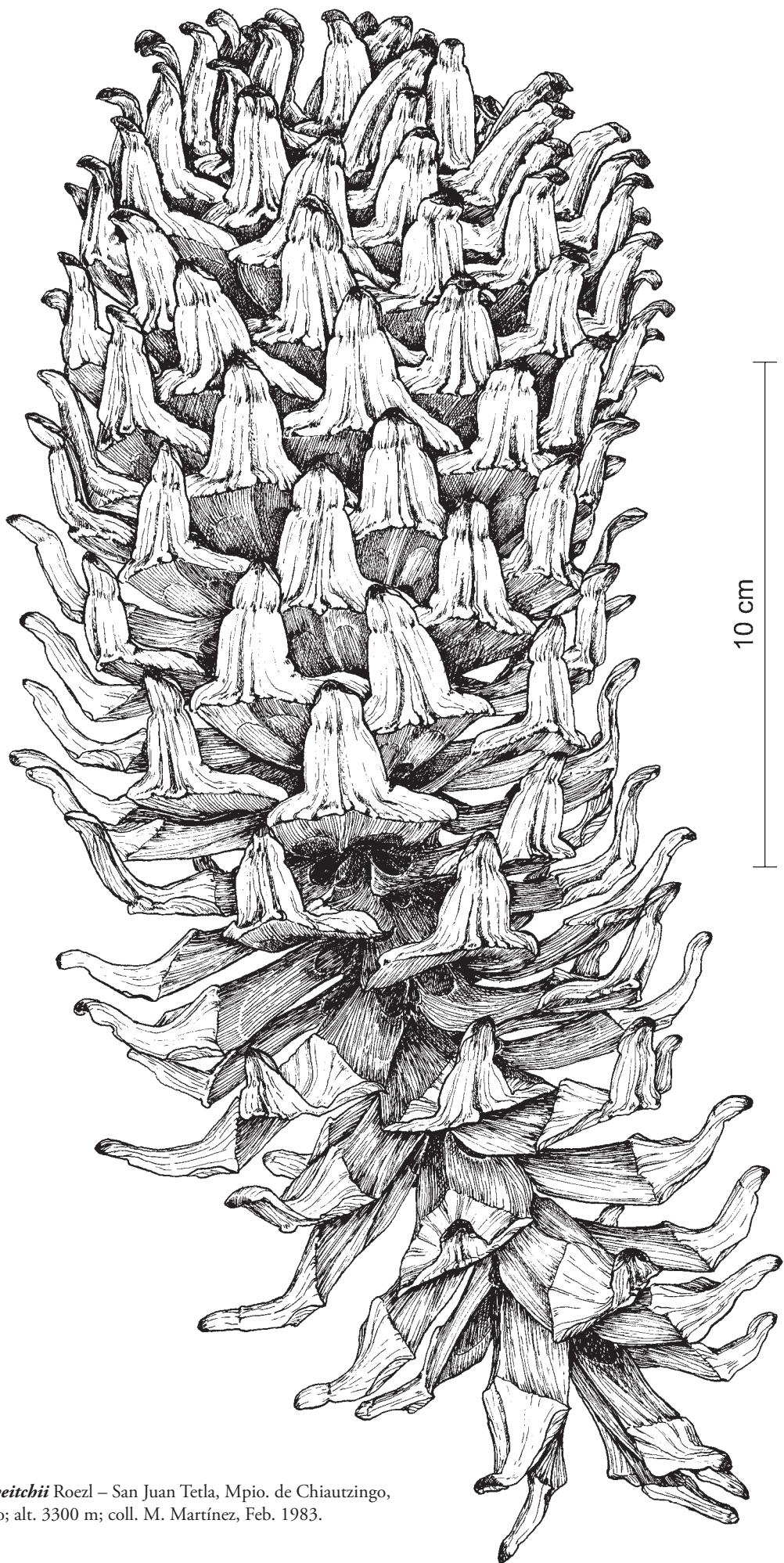


Fig. 6. *Pinus veitchii* Roezl – San Juan Tetla, Mpio. de Chiautzingo, Puebla, Mexico; alt. 3300 m; coll. M. Martínez, Feb. 1983.



Fig. 7. A: *Pinus dalatensis* Ferré var. *dalatensis* – Trai Mat near Dalat, Lam Dong Prov., Vietnam; alt. 1470 m; the type locality; R.B., Nov. 1986. B: *P. dalatensis* subsp. *dalatensis* var. *bidoupensis* Businský – the type specimen from Bi Doup mt. region, Lam Dong and Thuan Hai Prov. border, Vietnam; alt. 1900 m; R.B., Feb. 1994. C: *P. dalatensis* subsp. *procera* Businský – the type specimen from Mt. Ngok Niay, Dak Glei env., Ngoc Linh Mts., Gia Lai – Kon Tum Prov., Vietnam; alt. 1920 m; R.B., Jan. 1997.

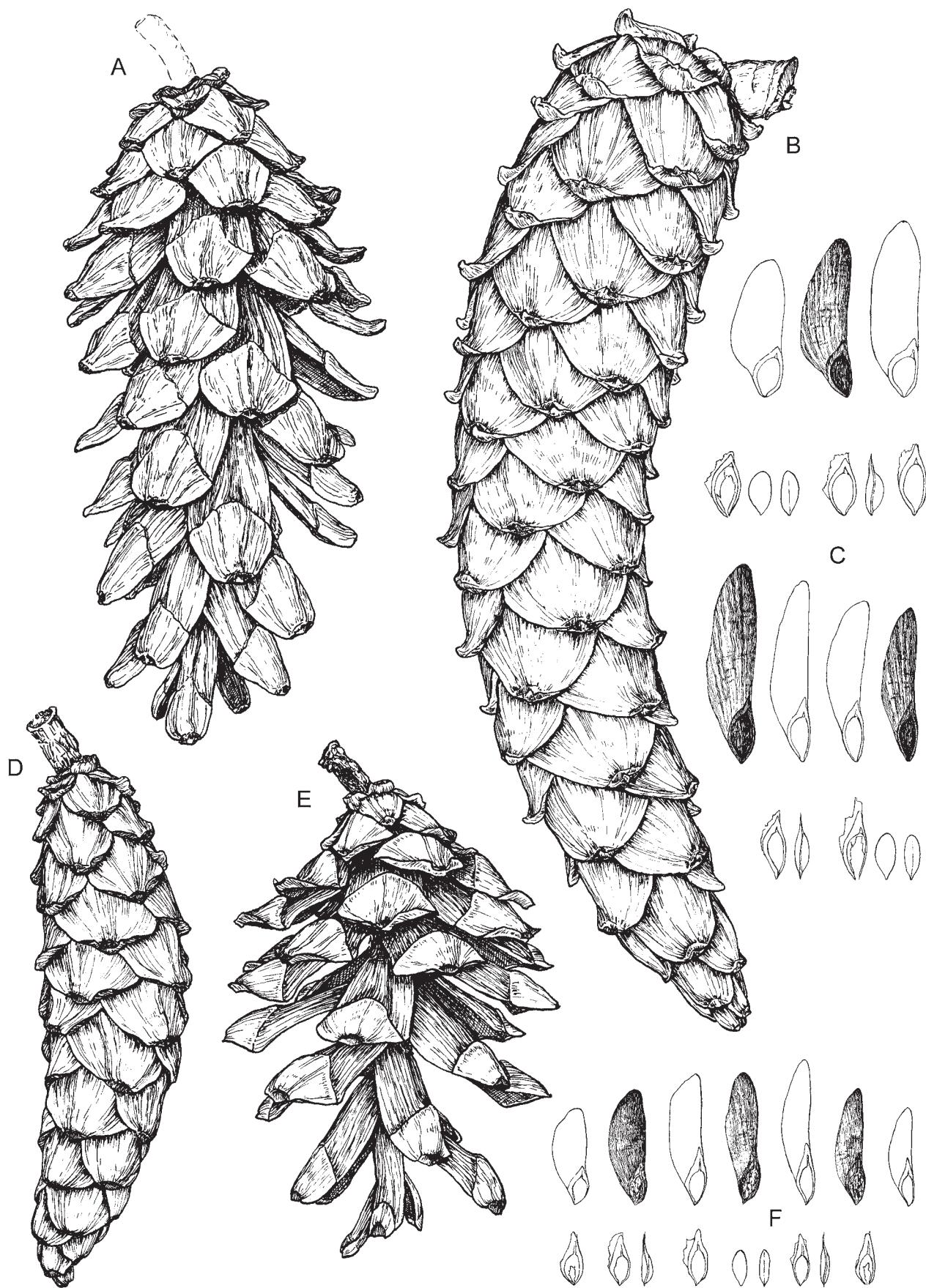


Fig. 8. A–C: *Pinus uyematsui* Hayata – (A) the type specimen from Arisan [Mt. Alishan], Taiwan; alt. ca 2150 m; coll. Uyematsu, Oct. 1912?; (B, C) at Southern Cross-Island Highway in NW corner of Taitung Co., Taiwan; alt. 2100 m; R.B., Dec. 1991. D–F: *P. orthophylla* Businsky – the type specimen from the Wuzhi Shan Mts., Hainan Island, China; alt. 1100 m; R.B., Dec. 1993.

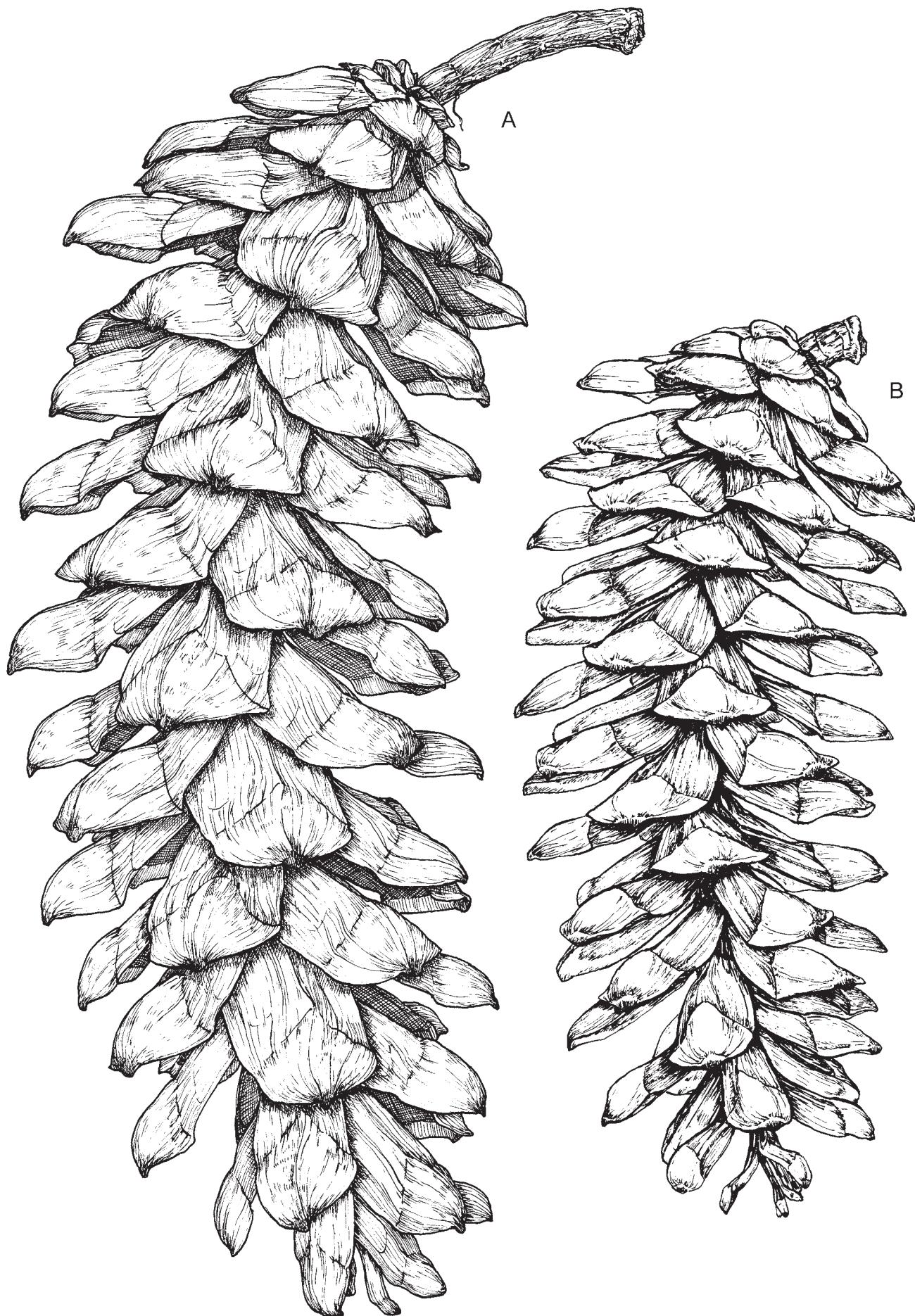


Fig. 9. **A:** *Pinus wallichiana* A. B. Jacks. **subsp. *wallichiana*** – upper Tarshing valley opposite to SE face of Nanga Parbat massif near Rupal village, N Pakistan; alt. 3200 m; R.B., Oct. 1994. **B:** *P. peuce* Griseb. – N of Orelek massif, S part of the Pirin Mts., Bulgaria; alt. 1750 m; R.B., Sept. 1985.

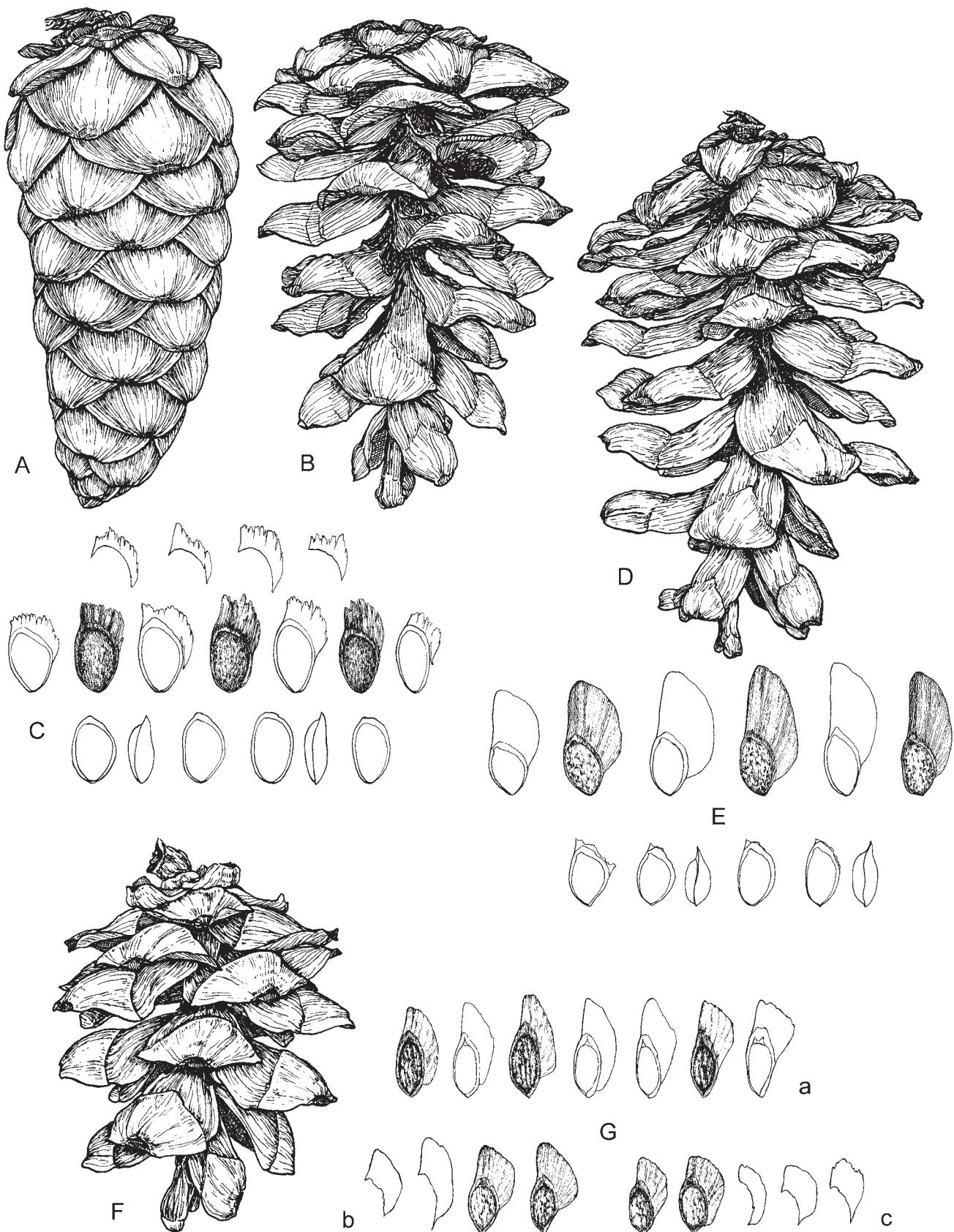


Fig. 10. **A–C:** *Pinus parviflora* Siebold et Zucc. subsp. *parviflora* – (A, B) Ishizuchi-san massif, Ehime Prefect., Shikoku, Japan; alt. 1650 m; R.B., Sept. 1997; (C) from alt. 1370 m. **D, E:** *P. parviflora* subsp. *pentaphylla* (Mayr) Businský – W side of Mt. Rakko, Hidaka Mts., Hokkaido, Japan; alt. 580 m; R.B., Aug. 1997. **F, G:** *P. eremitana* Businský – (F, Ga) the type specimen from Pa Co village env., border of Son La and Ha Son Binh Prov., N Vietnam; alt. ca. 1500 m; R.B., Feb. 1994; (Gb, Gc) the same data, but seeds from other two trees.

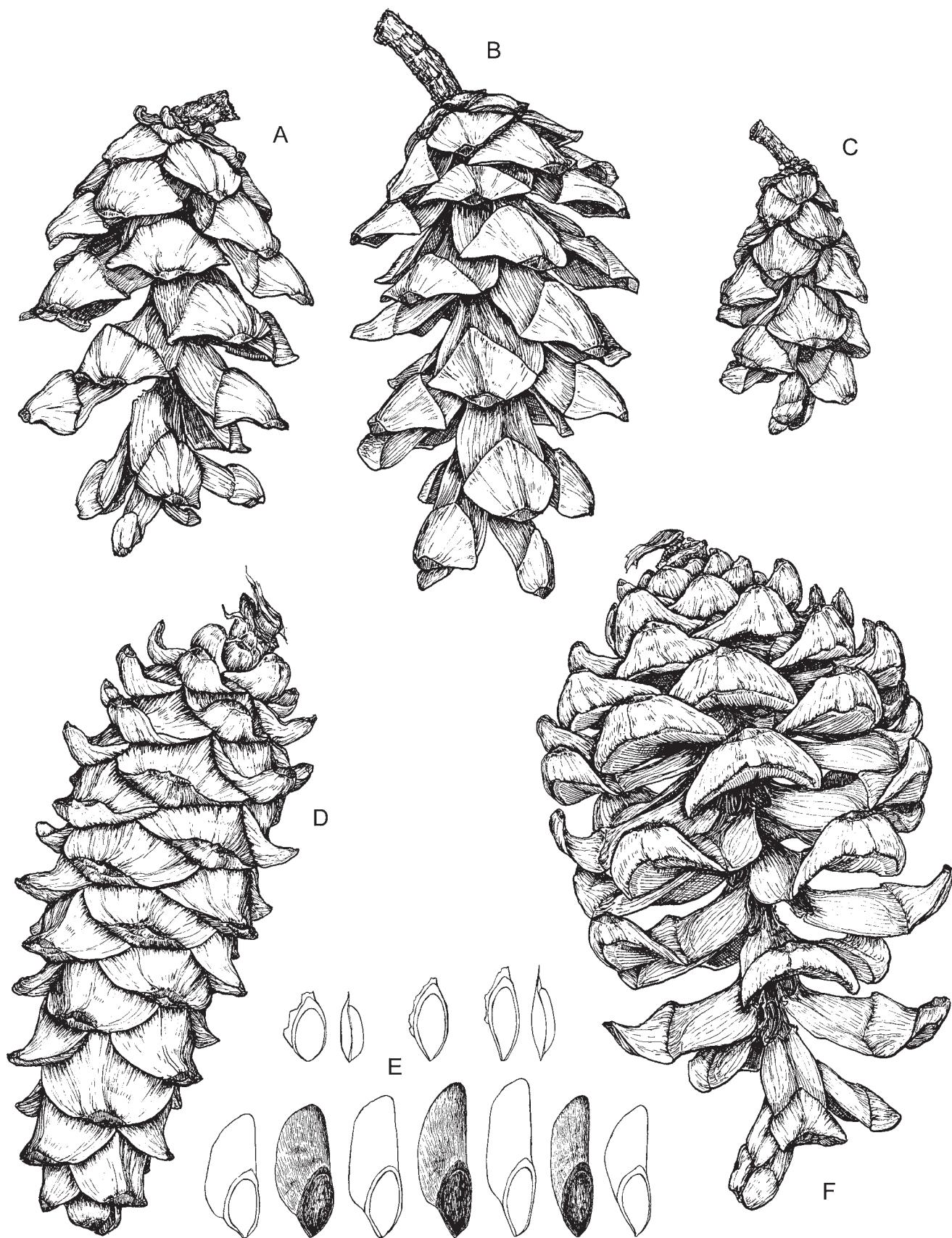


Fig. 11. A: *Pinus wangii* Hu et W. C. Cheng subsp. *wangii* – Taipingjie env, Malipo Co. near E boundary of Xichou Co., Wenshan Prefect., SE Yunnan, China; alt. 1550 m; R.B., July 1996. B: *P. wangii* subsp. *kwangtungensis* (Chun ex Tsiang) Businský – E of Jiufeng, Lechang Co., Guangdong (near boundary of Hunan), China; alt. 930 m; R.B., Jan. 1994. C: *P. wangii* subsp. *varifolia* (Nan Li et Y. C. Zhong) Businský – Lung Hoai env. near Duc Quang, Ha Lang distr., Cao Bang Prov., Vietnam; alt. ca 800 m; coll. L. V. Averyanov & Phan Ke Loc, Nov. 1998. D–F: *P. morrisonicola* Hayata – Kukuan env., Taichung Co., Taiwan; alt. 800 m; R.B., Nov. 1991.

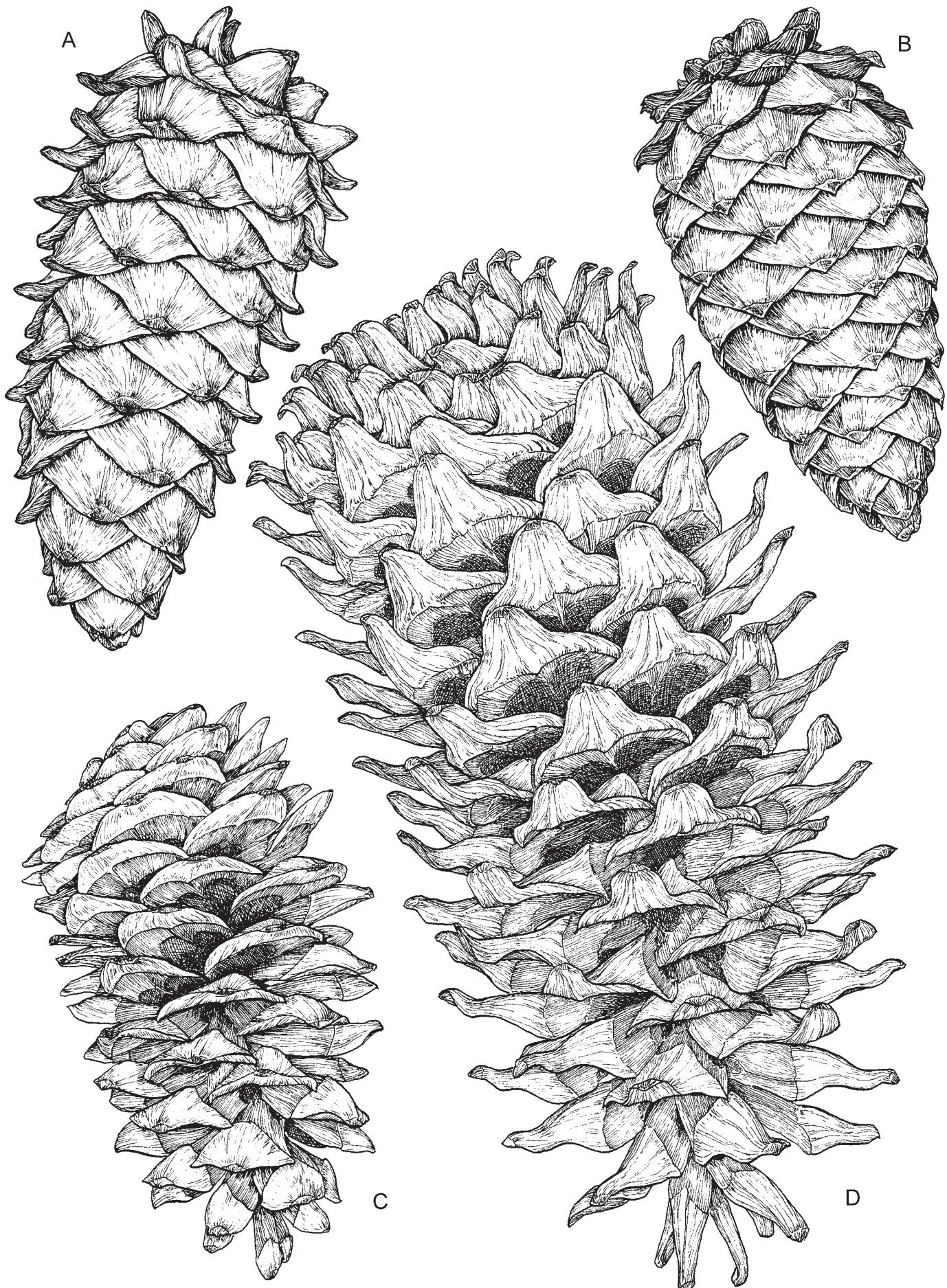
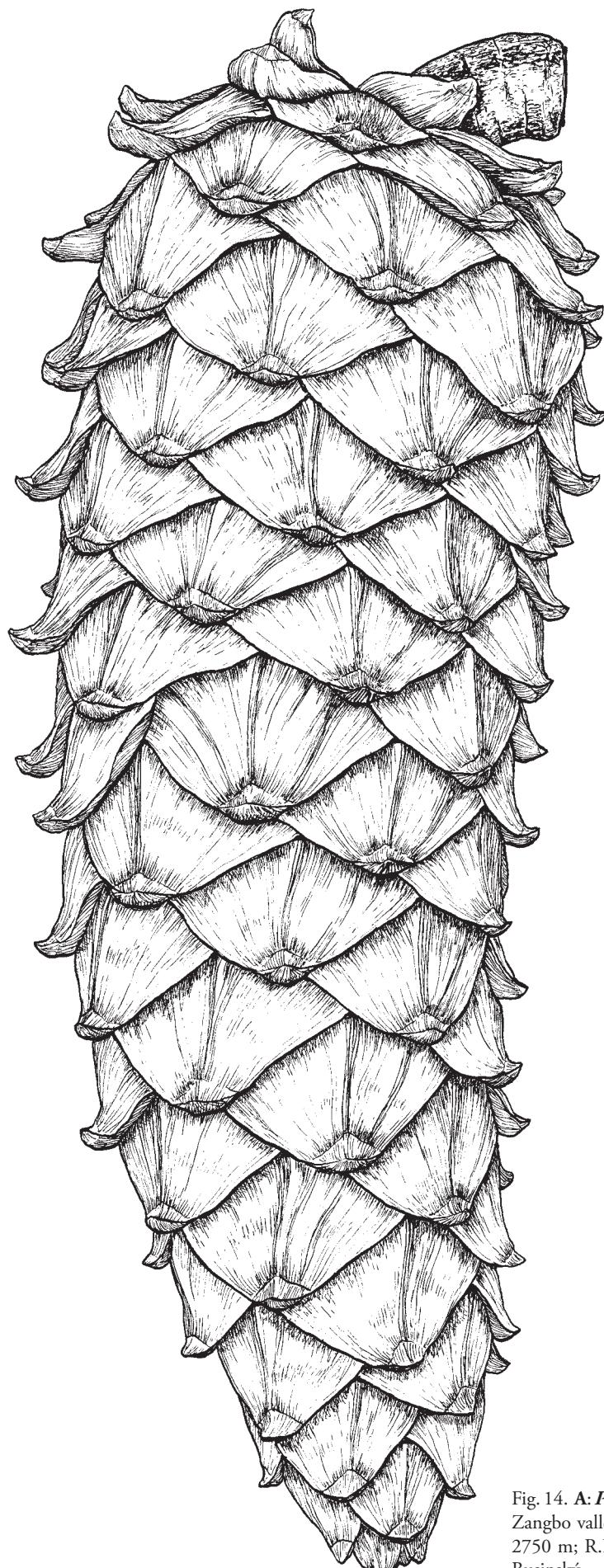


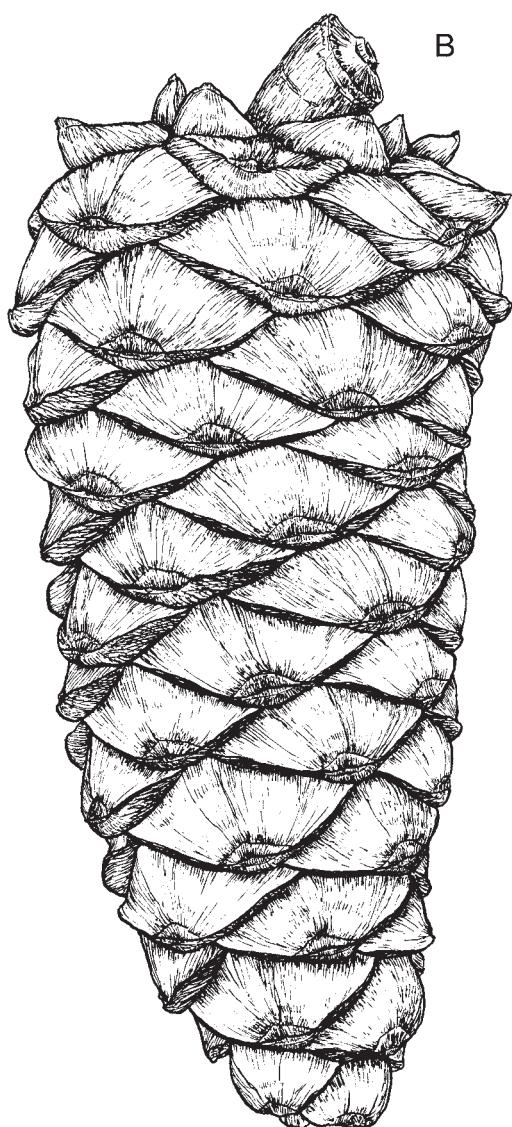
Fig. 12. A–C: *Pinus flexilis* E. James – (A) Craters of the Moon Natl. Monument, Butte Co., Idaho, USA; coll. D. Blažková, Sept. 1995. (B) S of Mt. Blanco, White Mountains, Inyo Co., California, USA; alt. 3200 m; coll. P. Korbář, Sept. 1995. (C) Trail Canyon NE of Boundary Peak, Esmeralda Co., Nevada, USA; alt. 3100 m; coll. J. D. Morefield et al., May 1987. D: *P. stylesii* Frankis ex Businský – La Siberia S of Villa de Arteaga, E of Saltillo, Coahuila, Mexico; c.u., 1976.



Fig. 13. *Pinus strobus* Engelm. – 18 km NW of Madera, Chihuahua, Mexico; alt. 2150 m; coll. J. P. Perry, Jr., Oct. 1978.



A



B

Fig. 14. A: *Pinus armandii* Franch. subsp. *armandii* – bottom of Parlung Zangbo valley 2 km NW of Bomi, Nyingtri Prefect., Xizang, China; alt. 2750 m; R.B., July 1992. B: *P. armandii* subsp. *mastersiana* (Hayata) Businský – SE slopes of Hsuehshan massif, Taichung Co., Taiwan; alt. 2400 m; R.B., Nov. 1991.

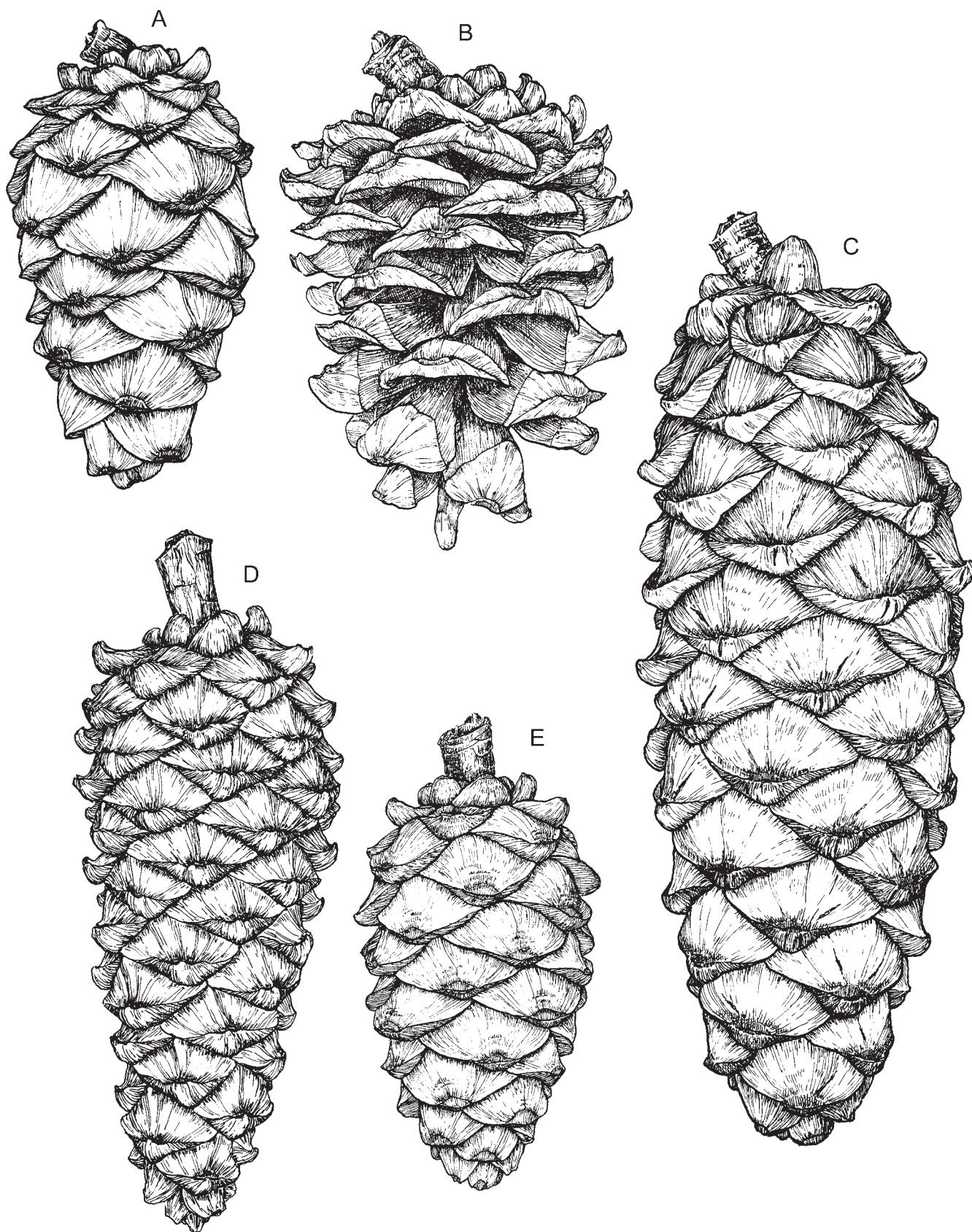


Fig. 15. A, B: *Pinus amamiana* Koidz. – cones from two trees from W slope of Mt. Kunawari, Yakushima Island, Kyushu region, Japan; alt. 320 m; R.B., Nov. 1991. C: *P. dabeshanensis* W. C. Cheng et Y. W. Law – cone from the type specimen tree from SE foot of Mt. Datongjian, Dabie Shan Mts., Yuexi Co., Anhui (at Hubei boundary), China; alt. 1000 m; R.B., Sept. 1998. D, E: *P. fenzeliana* Hand.-Mazz. – (D) the neotype specimen from NE slope of Ying Ge Ling massif, Hainan Island, China; alt. 1040 m; R.B., Dec. 1993; (E) NE slopes of the Daming Shan Mts., Shanglin Co., Guangxi, China; alt. 1030 m; R.B., Sept. 1998.

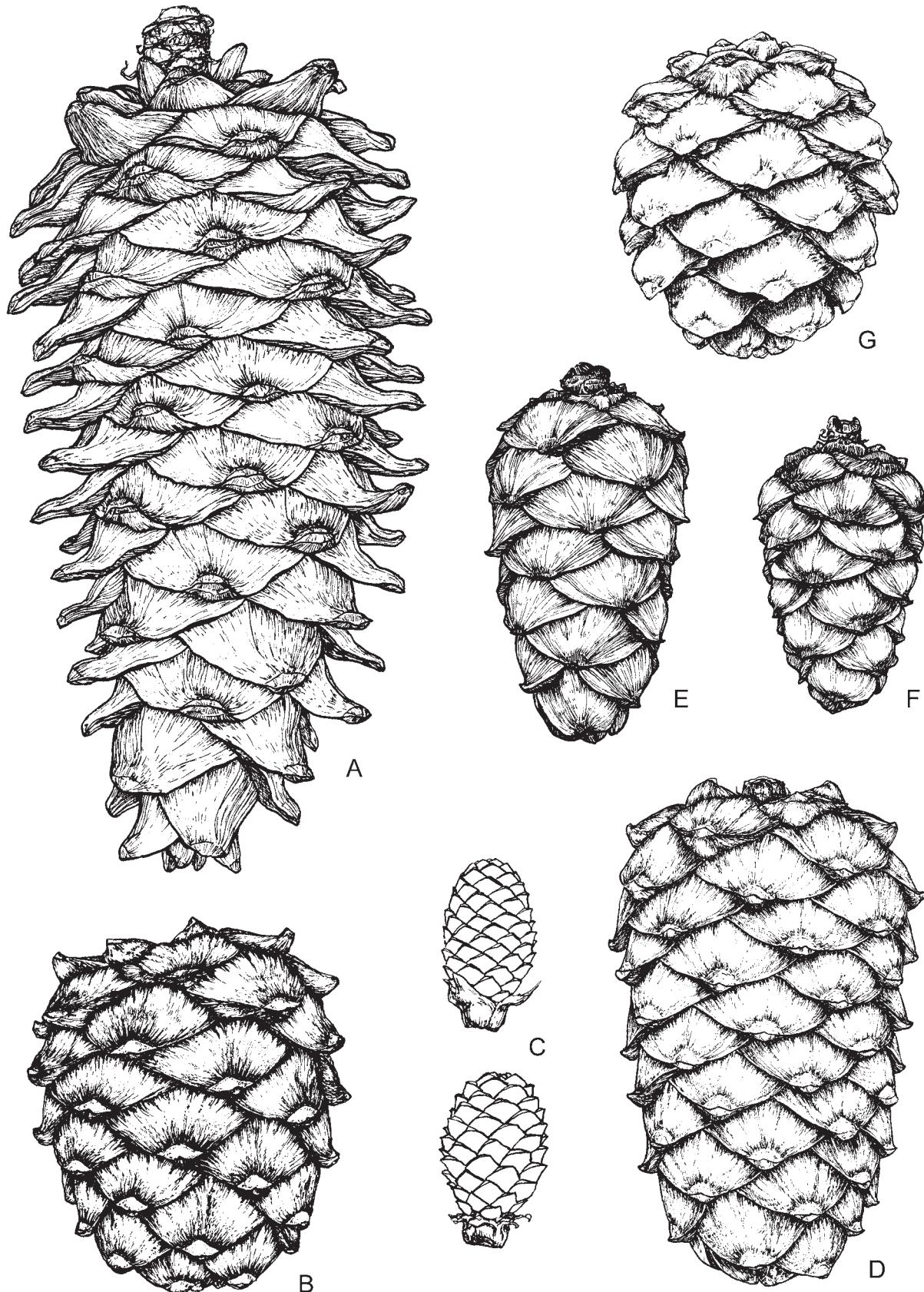


Fig. 16. **A:** *Pinus koraiensis* Siebold et Zucc. – Kamikochi env., Hida Mts., Nagano Prefect., Honshu, Japan; alt. 1600 m; R.B., Aug. 1997. **B–D:** *P. cembra* L. subsp. *cembra* – (B) Česká valley, Vysoké Tatry Mts., Slovakia; alt. 1600 m; R.B., Sept. 1983; (C) conelets from two trees and (D) cone from Velká Studená valley, Vysoké Tatry Mts., Slovakia; alt. 1400 m; R.B., Aug. 1983. **E, F:** *P. pumila* (Pall.) Regel – (E) Taisetsuzan Mts., central Hokkaido, Japan; alt. 1680 m; R.B., Aug. 1997; (F) Yariga mt. region, Hida Mts., Gigu and Nagano Prefect. boundary, Honshu, Japan; alt. 3080 m; R.B., Sept. 1997. **G:** *P. albicaulis* Engelm. – California, USA; sent from W. B. Critchfield, Sept. 1967.

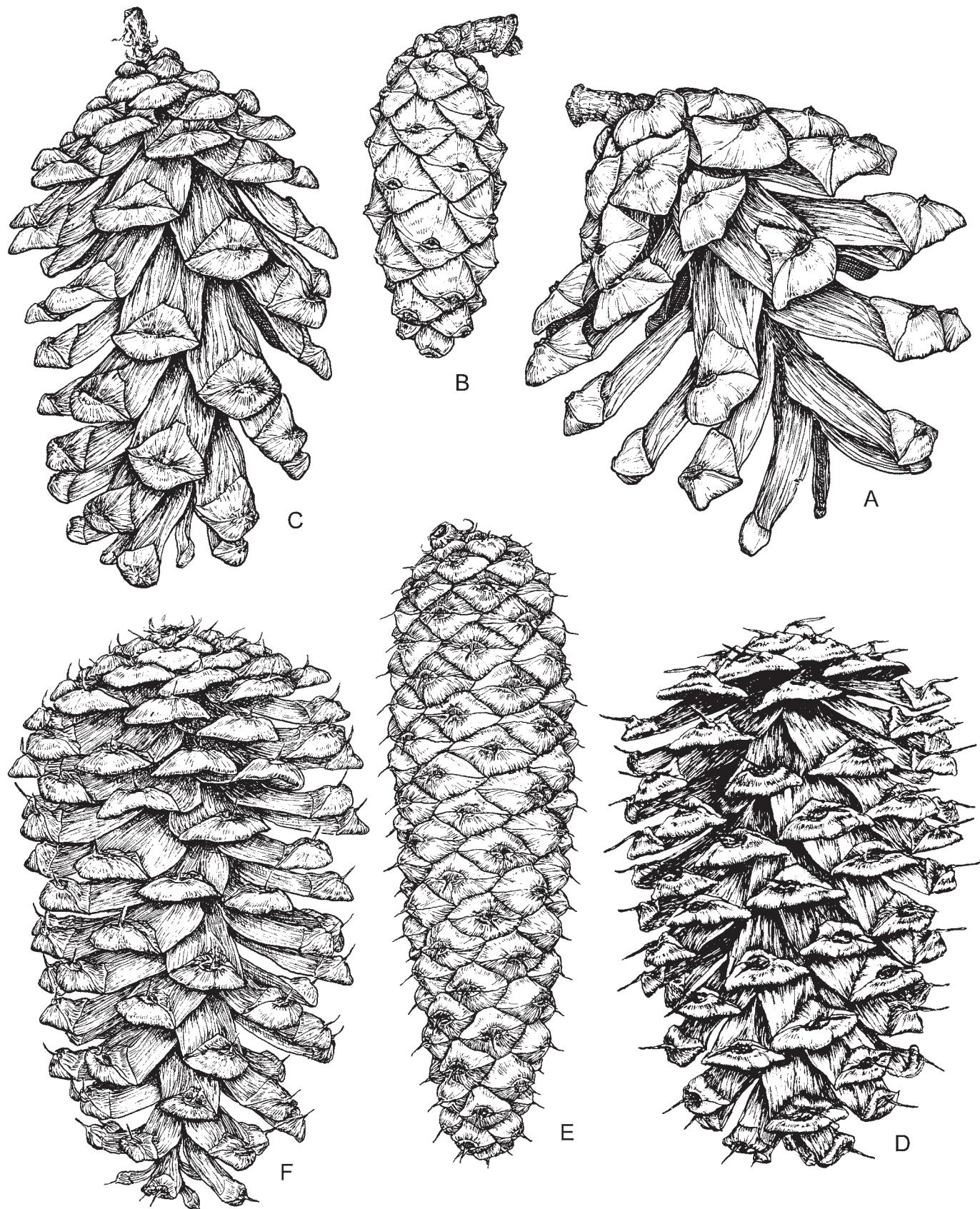


Fig. 17. A, B: *Pinus krempfii* Lecomte – Bi Doup mt. region, Lam Dong and Thuan Hai Prov. border, Vietnam; R.B., Feb. 1994; (B) alt. 1790, (A) alt. 1850 m. C: *P. balfouriana* Balf. subsp. *balfouriana* – Mt. Eddy, Siskiyou Co., California, USA; coll. R. C. Johnson, Oct. 1976. D: *P. aristata* Engelm. subsp. *aristata* – Heřmanův Městec, Chrudim Distr., E Bohemia, Czech Rep.; R.B., Nov. 1982; planted tree. E, F: *P. aristata* subsp. *longaeva* (D. K. Bailey) E. Murray – (E) betw. Mt. Blanco and Mt. Campito, White Mountains, Mono Co., California, USA; alt. 3400 m; coll. P. Korbář, Sept. 1995; (F) Bryce Canyon Natl. Park, Garfield Co., Utah, USA; alt. 2800 m; coll. J. Weger, Apr. 1994.

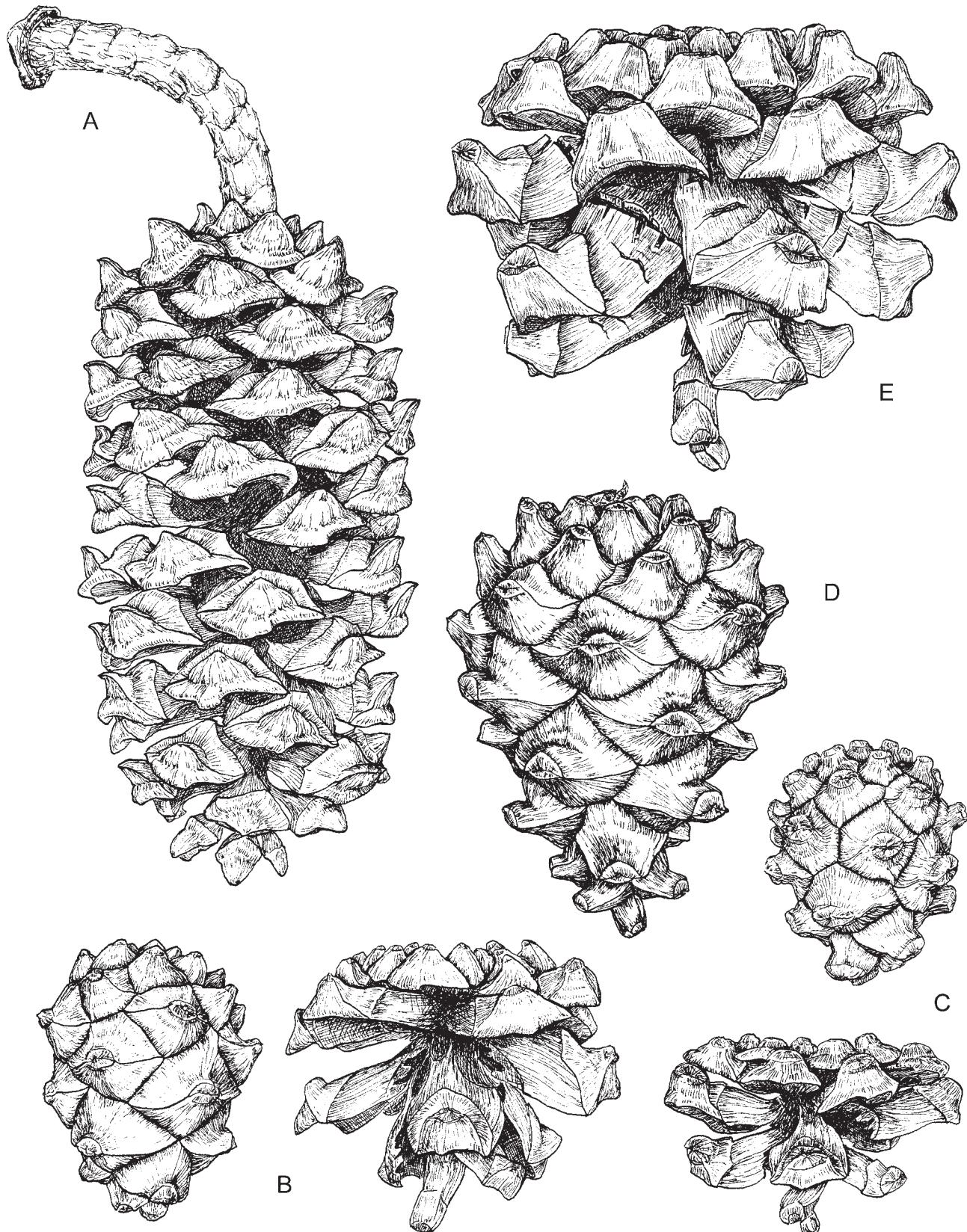


Fig. 18. **A:** *Pinus nelsonii* Shaw – north of Realejo, Sierra San Pedro, Guadalcázar, San Luis Potosí, Mexico; alt. 2100 m; coll. J. A. Pérez de la Rosa & G. Vargas A., Oct. 2002. **B, C:** *P. edulis* Engelm. – (B) two cones from the Canyonlands Natl. Park, Wayne Co., Utah, USA; alt. 1900 m; coll. D. Blažková, Sept. 1995; (C) two cones from the Sandia Mts., NE of Albuquerque, Bernalillo Co., New Mexico, USA; coll. J. Halda, Apr. 1989. **D, E:** *P. monophylla* Torr. et Frém. var. *monophylla* – (D) NE foot of Mt. Waucoba, Inyo Mts., Inyo Co., California, USA; alt. 2200 m; c.u., May 1976; (E) 10 km E of Scheideck, Ventura Co., California; coll. P. Korbář, Sept. 1995.

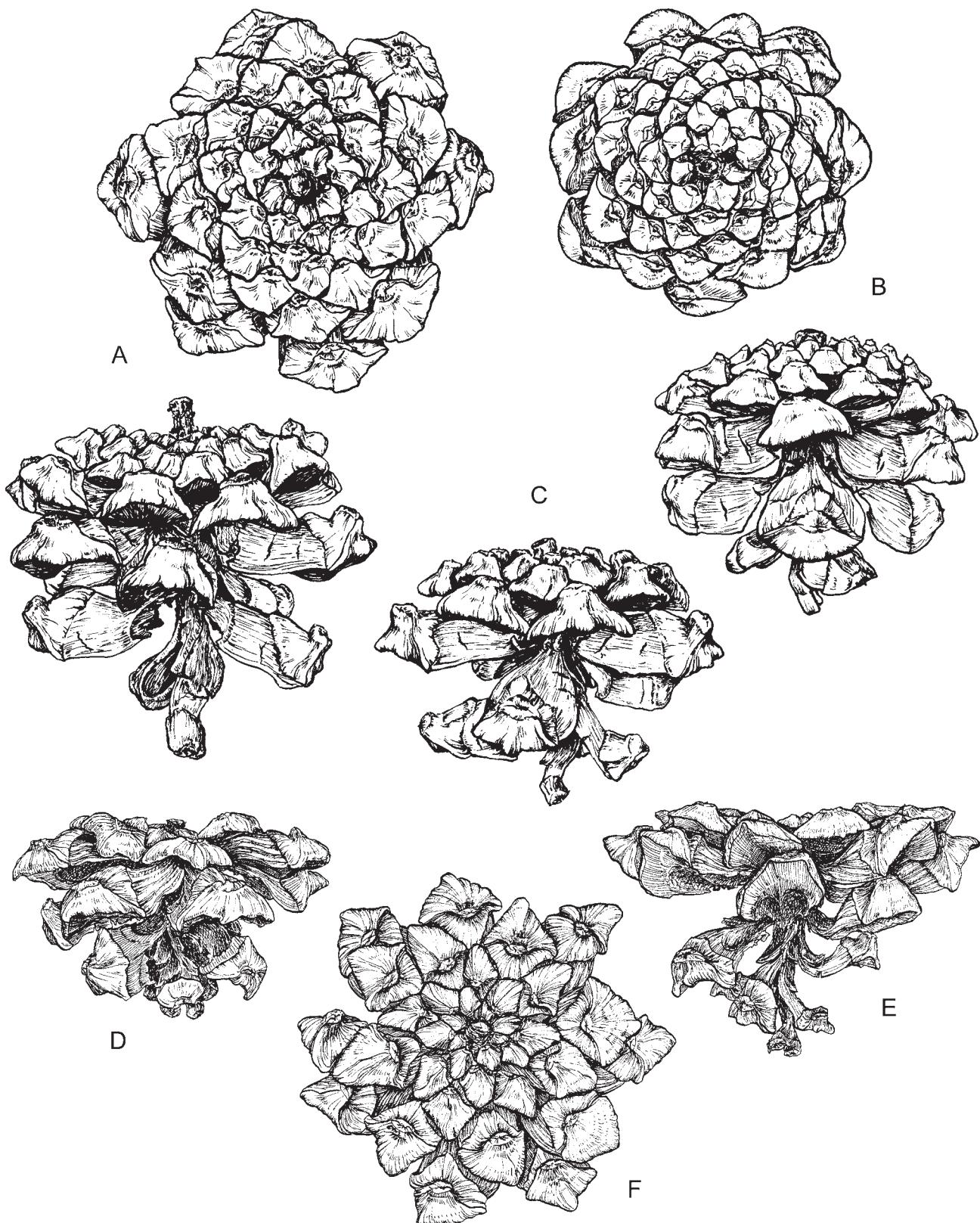


Fig. 19. A–C: *Pinus quadrifolia* Parl. ex Sudw. – (A) two views on the same cone from Laguna Hanson (Juárez), Sierra de Juárez, Ensenada, Baja California Norte, Mexico; alt. 1700 m; coll. J. Dobrý, Nov. 1984; (B, C) two cones from the Sierra San Pedro Martir Natl. Park, Baja California Norte, Mexico; coll. J. Dobrý, Nov. 1984 (B: two views on the same cone). D–F: *P. cembroides* Zucc. subsp. *cembroides* – (D) west foot of Cerro Peña Nevada, ENE of Doctor Arroyo, S Nuevo León, Mexico; alt. 1900 m; R.B., Feb. 2007; (E) at road N.L. 61 ca. 15 km NNW of La Ascensión towards Santa Clara de González, Nuevo León; alt. 2300 m; R.B., Feb. 2007; (F) Sierra de Alvarez E of San Luis Potosí City, San Luis Potosí, Mexico; alt. 2150 m; coll. V. Zelený, Mar. 1990.

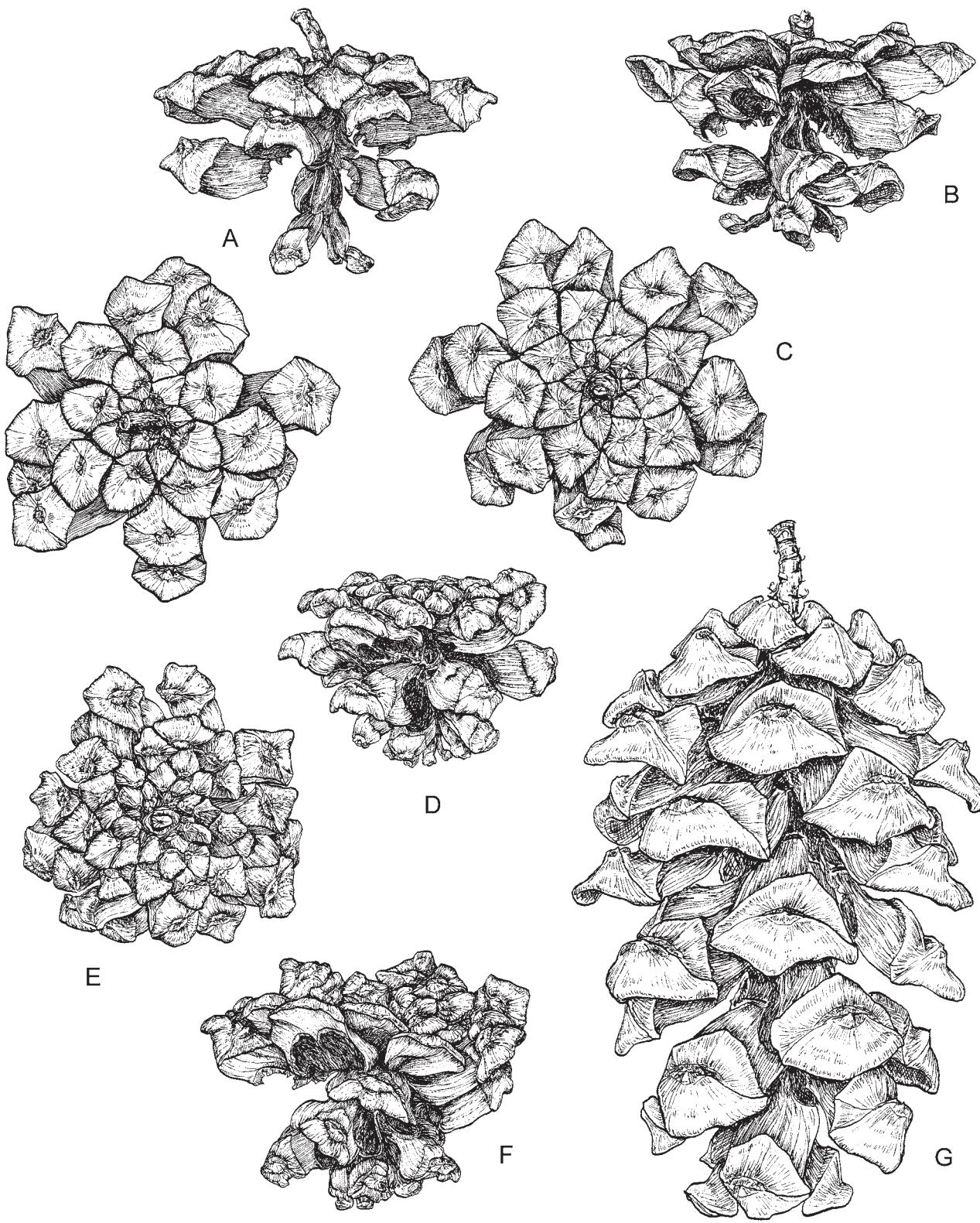


Fig. 20. **A:** *Pinus remota* (Little) D. K. Bailey et Hawksw. – two views on the same cone: S of highway MEX 40 from Santa Catarina (Monterrey) to Saltillo opposite branch to Rinconada, Nuevo León (near border of Coahuila), Mexico; alt. 1200 m; R.B., Feb. 2007. **B, C:** *P. johannis* M. F. Robert – two cones from the valley at N foot of the massif Cerro Peña Nevada, ENE of Doctor Arroyo, S Nuevo León, Mexico; alt. 2630 m; R.B., Feb. 2007. **D–F:** *P. culminicola* Andresen et Beaman – (D, E) two cones from the summit area of Cerro Potosí, Galeana, Nuevo León, Mexico; alt. 3670 m; the type locality; R.B., Feb. 2007; (F) Cerro Potosí; alt. 3450 m; coll. M. P. Frankis, Nov. 1991; **G:** *P. pinceana* Gordon – Barranca de Tolantongo gorge, Ixmiquilpan, Hidalgo, Mexico; alt. 1600 m; R.B., Feb. 1999.

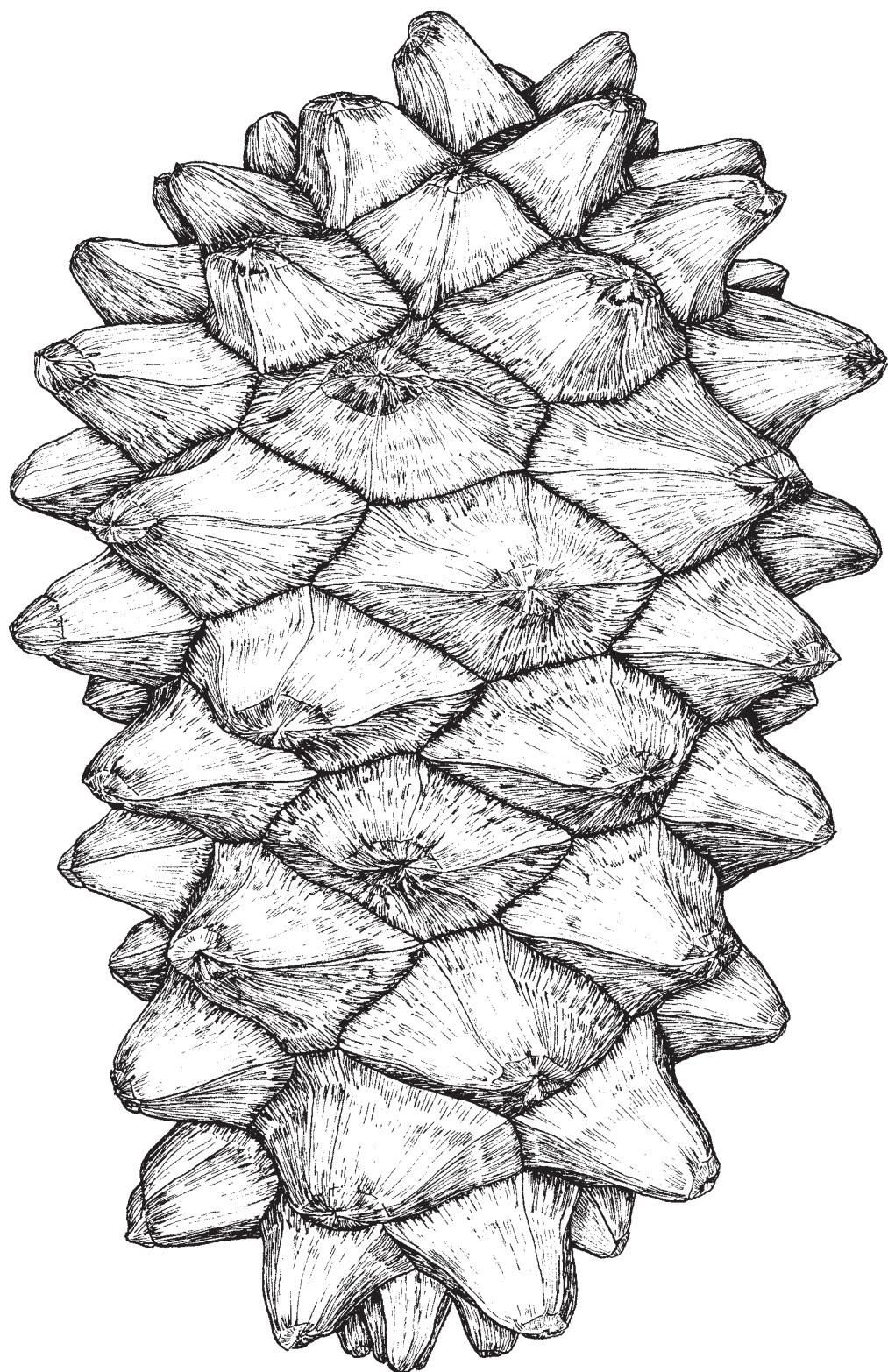


Fig. 21. *Pinus maximartinezii* Rzed. – W above Pueblo Viejo SW of Juchipila, Sierra de Morones, Zacatecas, Mexico; alt. 2150 m; R.B., Feb. 1999.

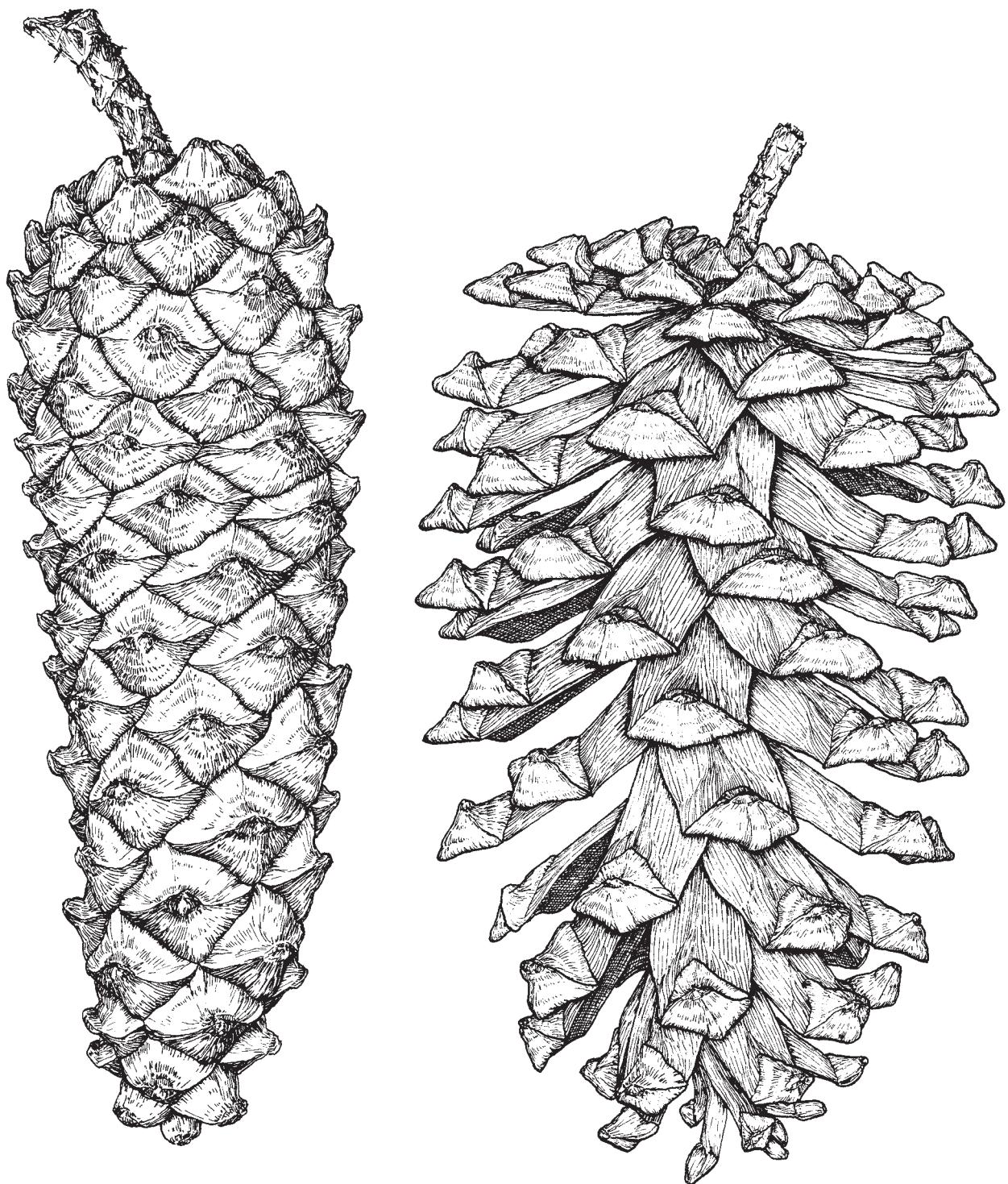


Fig. 22. *Pinus rzedowskii* Madrigal et M. Caball. – cones from two trees from Cerro Chiqueritas, Dos Aguas, Coalcomán de Matamoros, Sierra Madre del Sur, Michoacán, Mexico; alt. 2380 m; R.B., Mar. 1999.

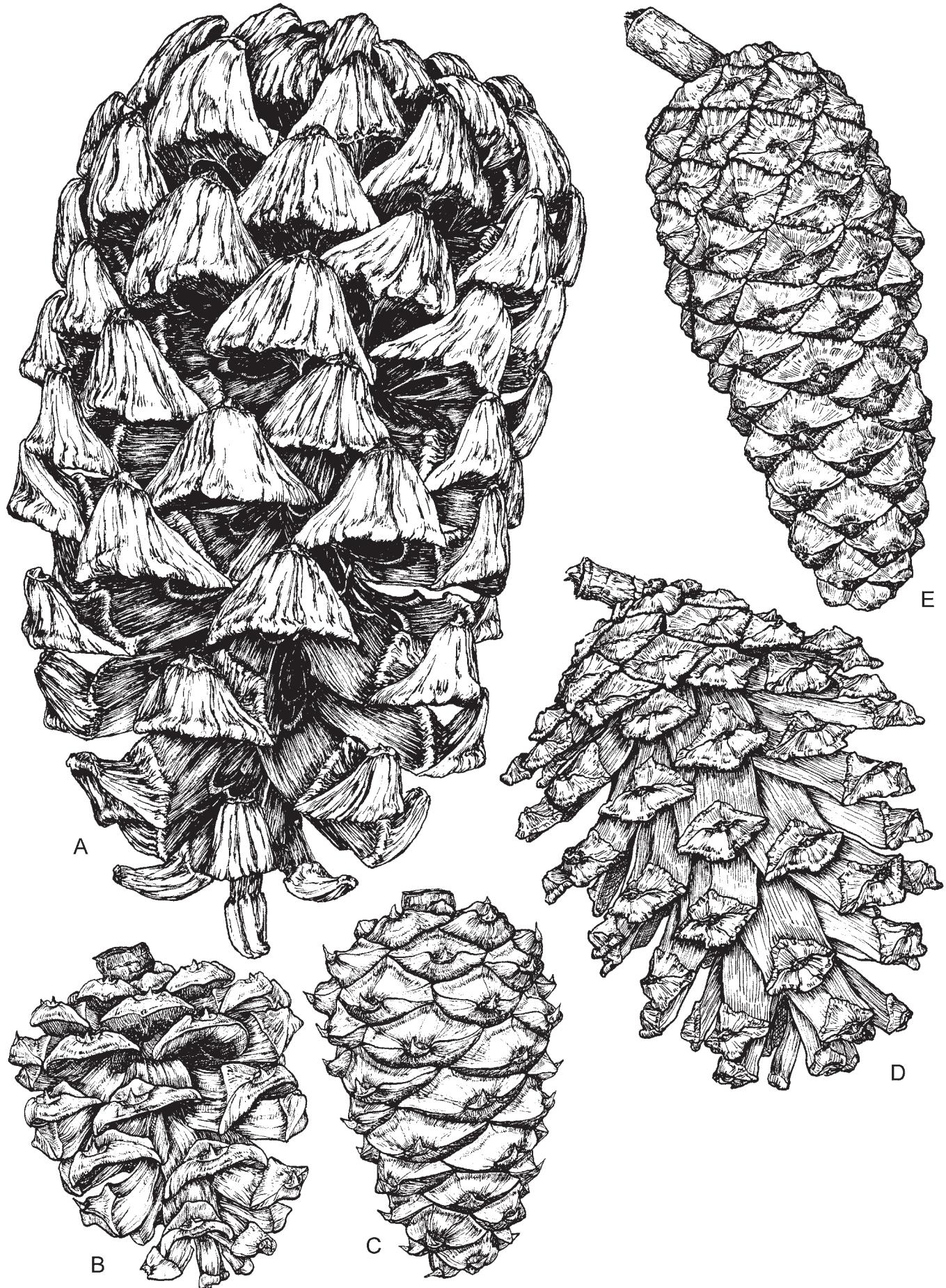


Fig. 23. A: *Pinus gerardiana* Wall. ex D. Don – Himachal Pradesh, India; c.u., June 1967. B, C: *P. bungeana* Zucc. ex Endl. – Changan Co., Qinling Shan Mts., S Shaanxi, China; alt. 1050 m; R.B., June 1995. D, E: *P. squamata* X. W. Li – mountains SE of Xinhua town, Qiaojia Co., NE Yunnan, China; alt. 2300 m; R.B., Aug. 1998.

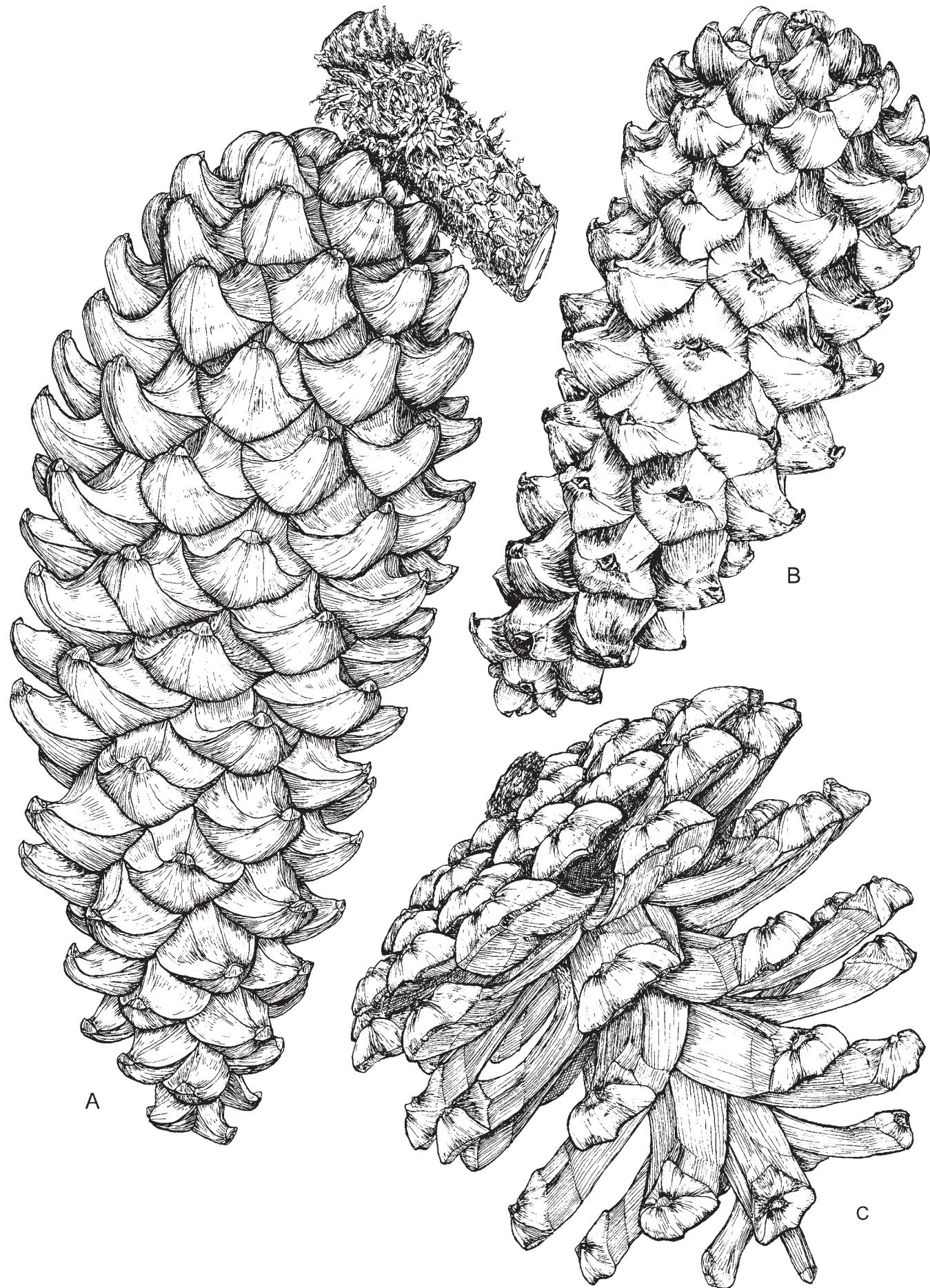


Fig. 24. *Pinus roxburghii* Sarg. — A: SW of Murree, Murree Hills above Islamabad, N Pakistan; alt. 1850 m; R.B., Nov. 1994; B: Bhowali, Naini Tal, Siwalik Range, N Uttar Pradesh, India; alt. 1800 m; c.u., Aug. 1978; C: Ratomato hill NW of Kathmandu, Nepal; alt. 1590 m; R.B., Aug. 1992.

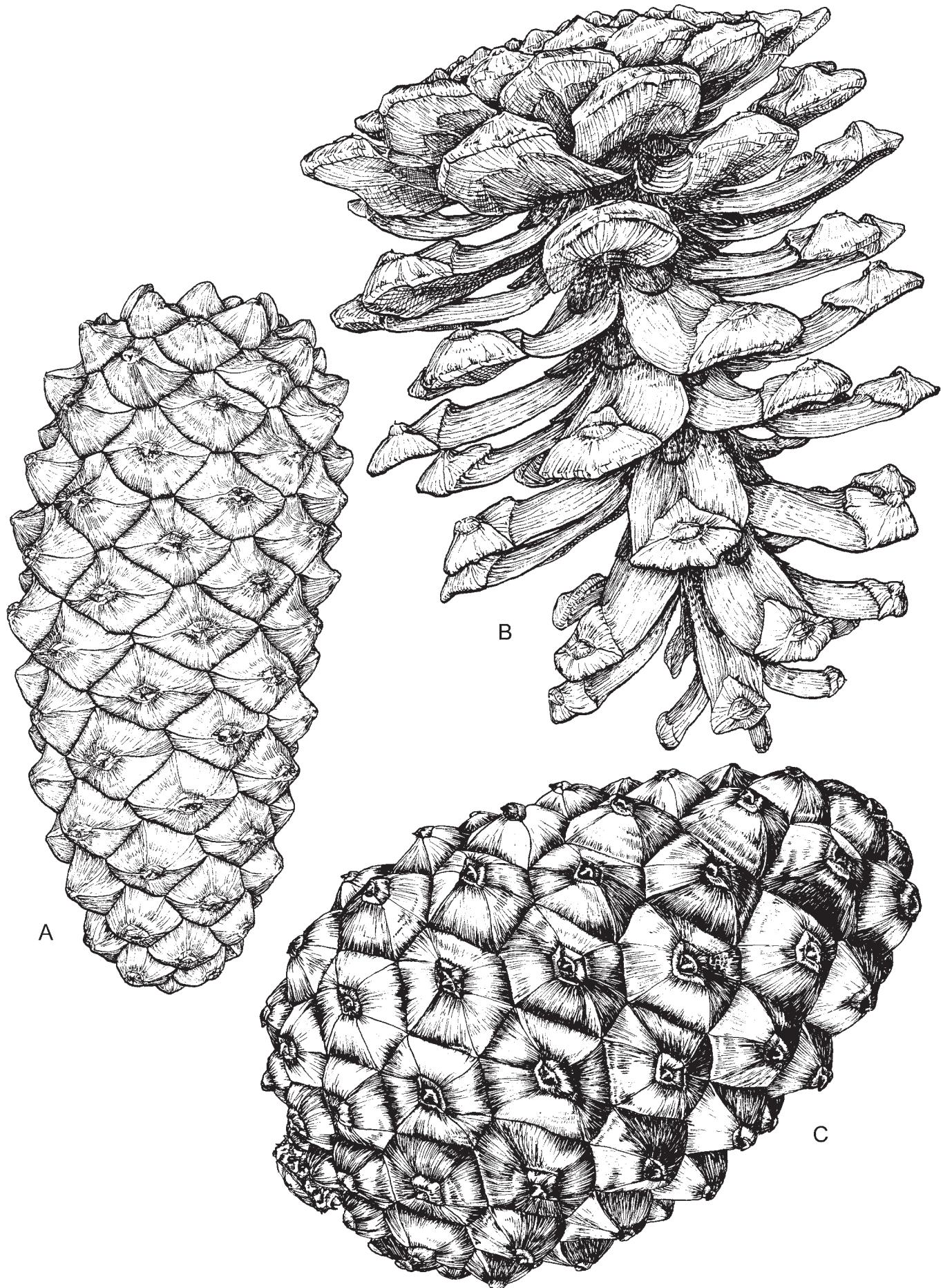


Fig. 25. **A, B:** *Pinus canariensis* C. Sm. – (A) Los Lanitos, Tenerife, Canary Islands; alt. 1500 m; coll. J. Weger, May 1993; (B) South of La Orotava, Tenerife, Canary Islands; alt. 1500 m; coll. J. Dostálek, May 2005. **C:** *P. pinea* L. – Opatia, Riječki Zaljev gulf, Adriatic Sea coast, Croatia, Yugoslavia; R.B., Aug. 1980; planted tree.

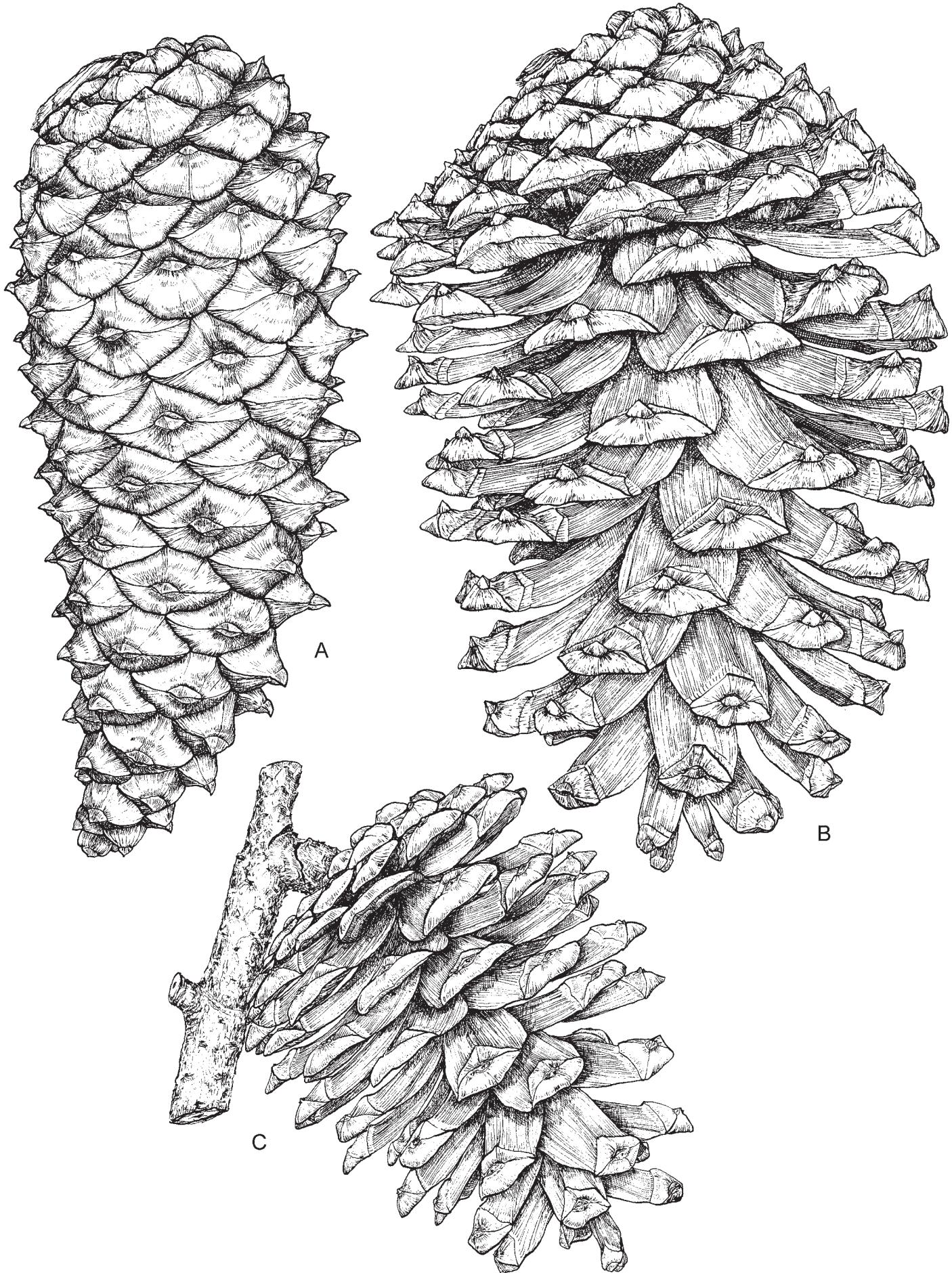


Fig. 26. **A, B:** *Pinus pinaster* Aiton – (A) betw. Mora de Rubielos and Puerto de San Rafael, Sierra de Gudar, Teruel Prov., Spain; alt. 1050 m; R.B., May 1993; (B) Atlantic coast S of Onesse river mouth, Landes Dept., France; near the sea level; R.B., May 1993. **C:** *P. halepensis* Mill. – NW of Belltall S of Tarrega, Lleida Prov., Spain; alt. 570 m; R.B., Apr. 1993.

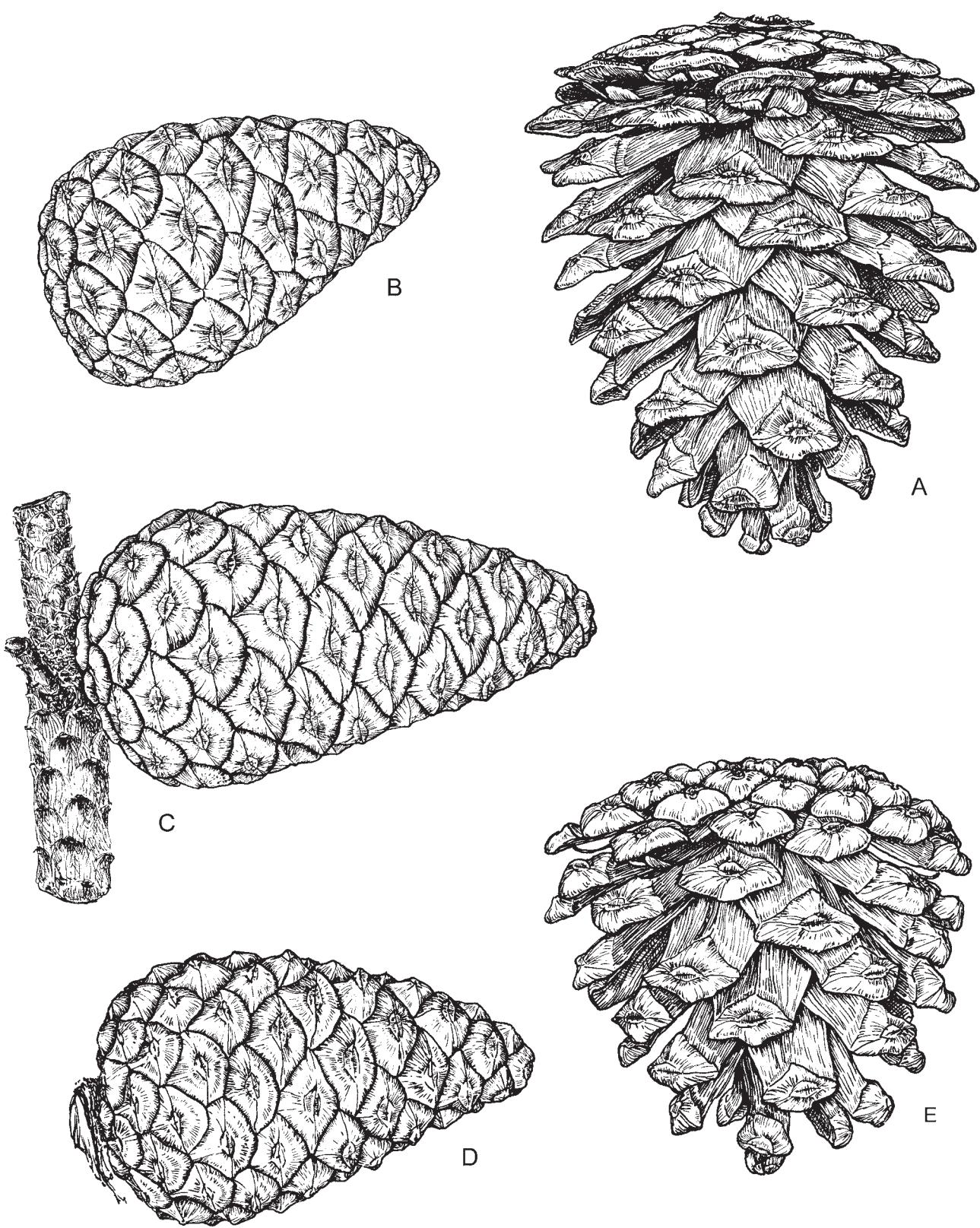


Fig. 27. **A:** *Pinus brutia* Ten. var. *brutia* – Kale Dagi massif SW of Aladag, Ala Daglar Mts. region, Adana Prov., Turkey; alt. 1260 m; R.B., Oct. 2003. **B, C:** *P. brutia* subsp. *pityusa* (Steven) Nahal – cones from two trees from Dagomys NW of Soči, W Caucasus foot at Black Sea NE coast, Russia; alt. 70–100 m; R.B., July 1993; **D, E:** *P. brutia* subsp. *eldarica* (Medw.) Nahal – cones from one tree from Eller Oughi ridge W of Kesaman village, El'dar steppe, Gyandzha (Kirovabad) region, Azerbaijan; alt. 440 m; R.B., Oct. 2003.

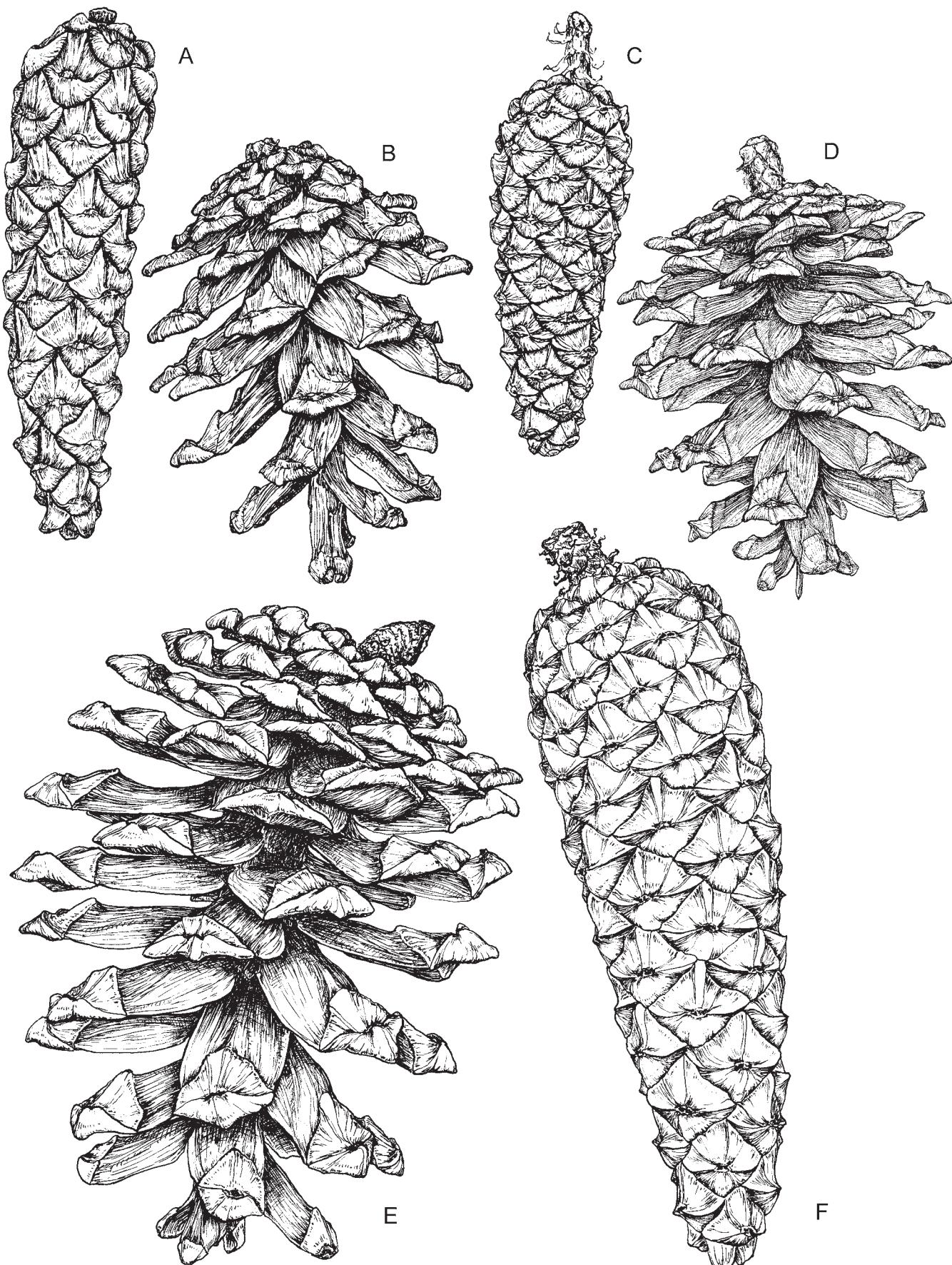


Fig. 28. **A, B:** *Pinus merkusii* Jungh. et de Vriese subsp. *merkusii* – (A) hills SE of Pangaribuan village W of Tarutung, Sumatera Utara Prov., Sumatra, Indonesia; alt. 1270 m; R.B., Mar. 1994; (B) NE shore of Lake Toba near Parapat, Sumatera Utara Prov., Sumatra, Indonesia; alt. 900 m; R.B., Mar. 1994. **C, D:** *P. merkusii* subsp. *ustulata* Businský – hills ca. 25 km SE of Santa Cruz, Mindoro Occidental Prov., Mindoro, Philippines; (C) alt. 390 m, (D) 470 m; R.B., Apr. 2000. **E, F:** *P. latteri* Mason – betw. Di Linh and Duc Trong, Lam Dong Prov., Vietnam; alt. 880 m; R.B., Nov. 1986.

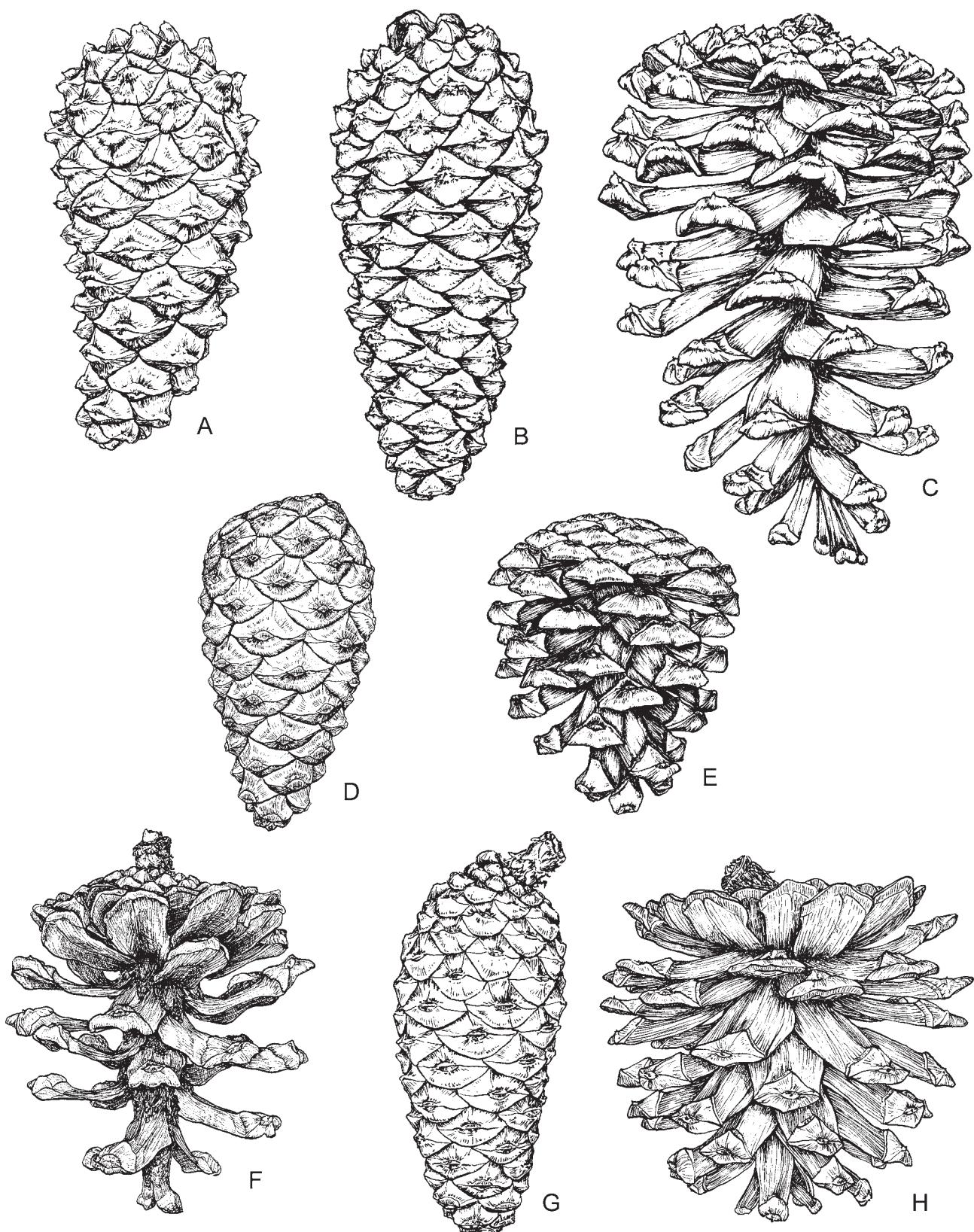


Fig. 29. A–C: *Pinus heldreichii* H. Christ – cones from Bela Reka valley, N part of the Pirin Mts., Bulgaria; alt. 1970–2050 m; R.B., Sept. 1985. D, E: *P. resinosa* Aiton – (D) Sturgeon Falls, Lake Nipissing region, Ontario, Canada; c.u., Sept. 1983; (E) Kysihýbl Arboretum, Banská Štiavnica, Slovakia; R.B., Oct. 1979; planted tree. F: *P. tropicalis* Morelet – SW of Nueva Gerona, Isla de Pinos [Isla de la Juventud], Cuba; coll. J. Komárek, Sept. 1980. G, H: *P. masoniana* Lamb. – (G) along road to Tam Dao, Vinh Phu Prov., Vietnam; alt. 600 m; R.B., Nov. 1986; plantation; (H) Xingshan Co., W Hubei, China; alt. 1400 m; R.B., July 1995.

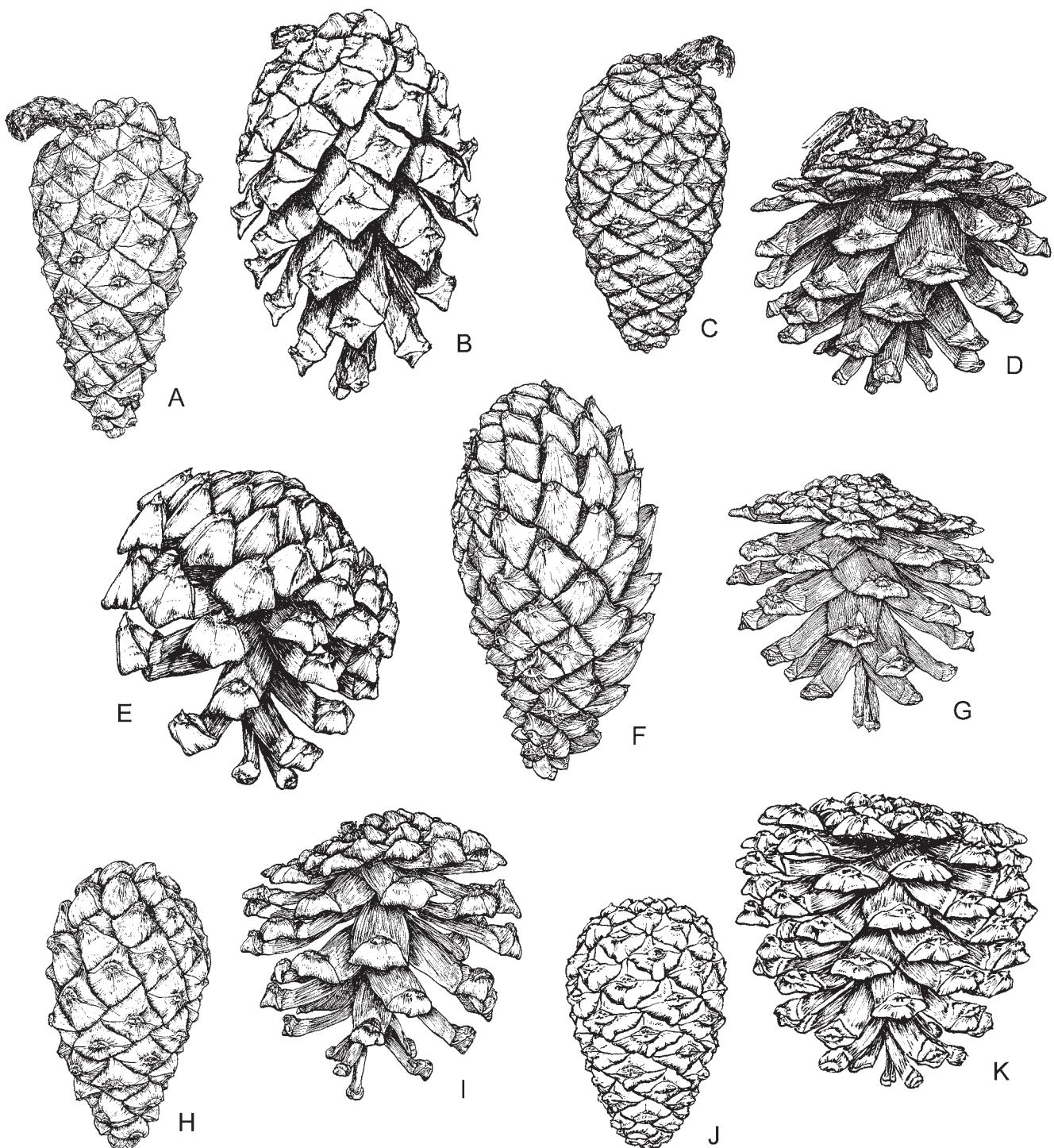


Fig. 30. **A, B:** *Pinus sylvestris* L. var. *sylvestris* – (A) Muráň env., Muránska planina plateau, Slovenské Rudohorie Mts., Slovakia; alt. 950 m; R.B., May 1988; (B) Tobolka env., S Bohemian Karst, Beroun Distr., C Bohemia, Czech Rep.; alt. 400 m; R.B., Jan. 1981. **C, D:** *P. densiflora* Siebold et Zucc. – (C) Mt. Samukaze, Ishizuchi Mts., Kochi Prefect., Shikoku, Japan; alt. 1140 m; R.B., Sept. 1997; (D) Takakuma Mts., Kagoshima Prefect., Kyushu, Japan; alt. 550 m; R.B., Oct. 1991. **E, F:** *P. uncinata* Ramond ex DC. var. *uncinata* – (E) Bouillouses, Pyrénées Orientales, S France; alt. 1900 m; c.u., July 1931; (F) at the road to Port d'Envalira from Andorra, Andorra; alt. 2170 m; R.B., Apr. 1993. **G:** *P. uncinata* subsp. *uncinata* var. *ancestralis* Businsky – the type specimen from Isar valley SW of Vorderriss, Oberbayern, Germany; alt. 800 m; R.B., Sept. 1992. **H, I:** *P. uncinata* subsp. *uliginosa* (Neumann) Businsky – (H) Farské bažiny peat bog Natur. Res., Lesná, Tachov Distr., W Bohemia, Czech Rep.; alt. 730 m; R.B., July 1991; (I) Malý Luh peat bog, Volary, Prachatice Distr., Šumava Mts., S Bohemia, Czech Rep.; alt. 740 m; R.B., July 1986. **J, K:** *P. mugo* Turra – (J) Mt. Dautov vrch, N part of the Pirin Mts.; alt. 2270 m; R.B., Sept. 1985; (K) Mt. Czernija vrch, S part of the Pirin Mts.; alt. 2050 m; R.B., Sept. 1985.

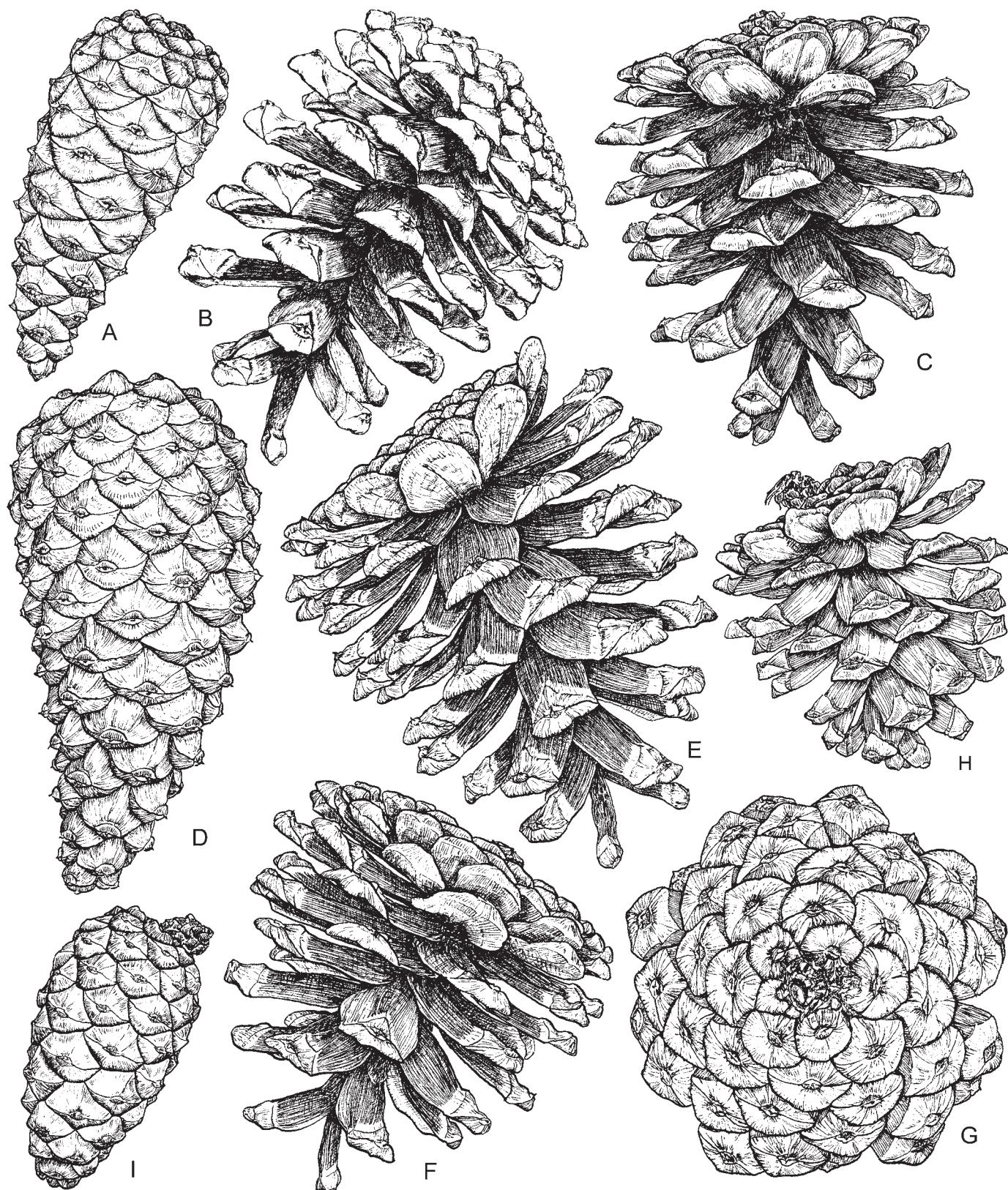


Fig. 31. A, B: *Pinus nigra* J. F. Arnold subsp. *nigra* – (A) SW slope of Höllental valley betw. Kaiserbrunn and Hirschwang, Schneeberg Mts., Niederösterreich – Steirische Kalkalpen, Niederösterreich, Austria; alt. 750 m; R.B., Aug. 1999; (B) Sušica valley, Rhodope Mts., Bulgaria; alt. 800 m; R.B., May 1983. C: *P. nigra* subsp. *salzmannii* (Dunal) Franco var. *salzmannii* – SE of Puerto de San Rafael, Sierra de Gudar, Teruel Prov., Spain; alt. 1520 m; R.B., May 1993. D, E: *P. nigra* subsp. *pallasiana* (Lamb.) Holmboe var. *pallasiana* – (D) SE coastal slopes of Babugan Yajla massif, Krymskie Gory Mts., Krym, Ukraine; alt. 950 m; R.B., Nov. 2002; (E) east of Domkayatepe pass betw. Tosya and Iskilip, E Köroglu Daglari Mts., Kastamonu and Corum Prov. border, Turkey; alt. 1650 m; R.B., Oct. 2003. F, G: *P. nigra* subsp. *fenzleyi* (Antoine et Kotschy ex Carrière) Franco – (F) Kale Dagi massif SW of Aladag, Ala Daglar Mts. region; alt. 1230 m; (G) Doganbeyli env., Tahtali Daglari Mts.; alt. 1490 m; both in Adana Prov., Turkey; R.B., Oct. 2003. H, I: *P. thunbergii* Parl. – (H) NW coast of Yakushima Island, Kyushu region, Japan; near the sea level; R.B., Nov. 1991; (I) Yuki env., Tokushima Prefect., Shikoku, Japan; alt. 50 m; R.B., Sept. 1997.

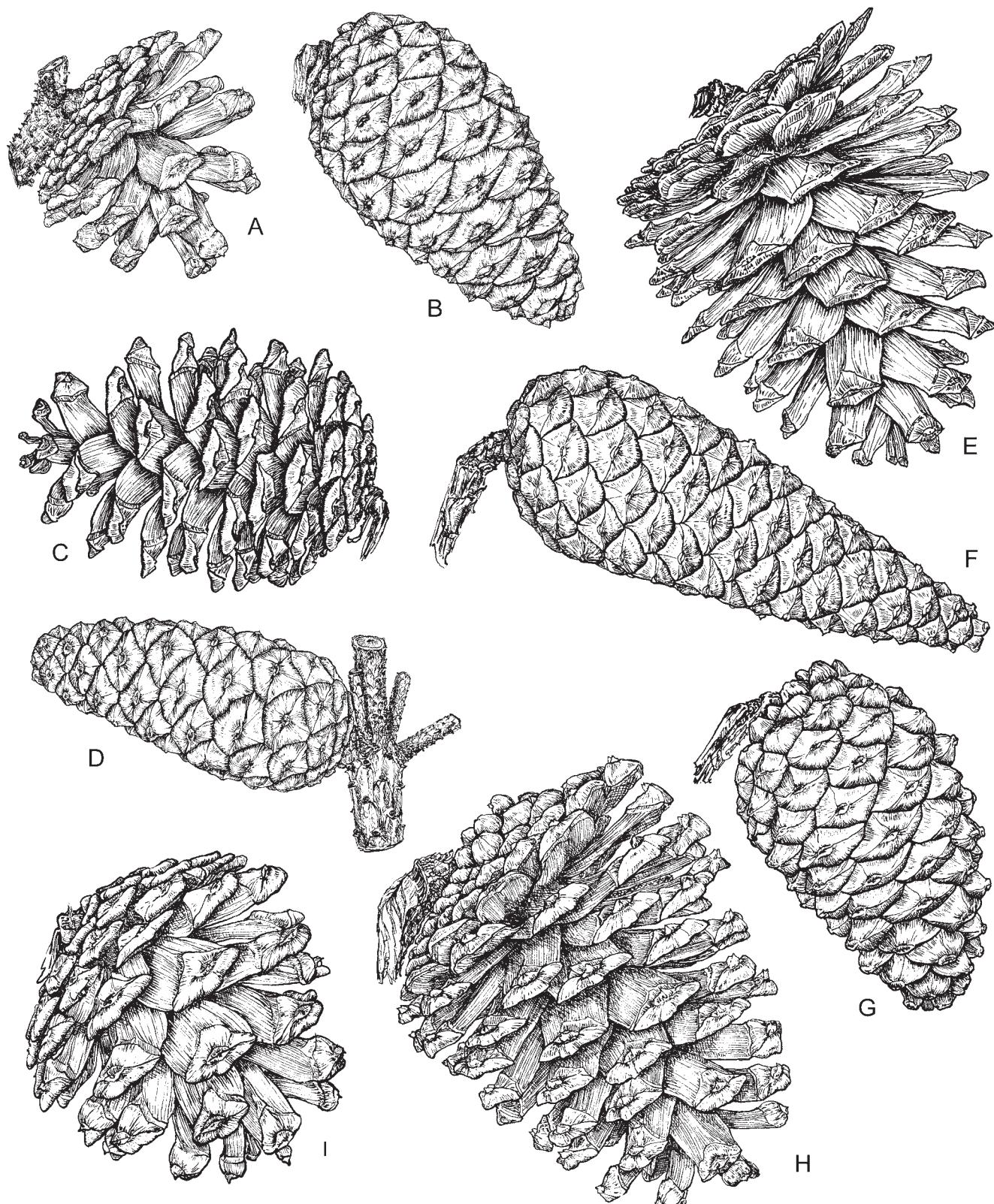


Fig. 32. **A:** *Pinus hwangshanensis* W. Y. Hsia subsp. *hwangshanensis* – SW border of Rucheng Co., Hunan (near boundary of Guangdong), China; alt. 1480 m; R.B., Jan. 1994; **B:** *P. hwangshanensis* subsp. *transfluminea* Businský – opposite to SE foot of Mt. Datongjian, Dabie Shan Mts., Yuexi Co., Anhui (at Hubei boundary), China; alt. 1030 m; R.B., Sept. 1998. **C, D:** *P. luchuensis* Mayr – cones from one tree: NW of Ishigaki town, Ishigaki Island, Nansei (Ryukyu) Islands, Japan; alt. 80 m; R.B., Nov. 1991. **E, F:** *P. fragilissima* Businský – cones from two trees (closed cone is from the type specimen) from Wulu env., Hsinwulu valley along Southern Cross-Island Highway, Taitung Co., Taiwan; alt. 930 m; R.B., Dec. 1991. **G, H:** *P. taiwanensis* Hayata – (G) along the road from Tayuling to Wushe, N part of Nantou and Hualien Co. boundary; alt. 2930 m; (H) near the top of the Central Cross-Island Highway at Tayuling, N part of Hualien Co.; alt. 2550 m; both in Taiwan, R.B., Dec. 1991. **I:** *P. tabuliformis* Carrière var. *tabuliformis* – Xunyangba env., Ningshan Co., Qinling Shan Mts., S Shaanxi, China; alt. 1800 m; R.B., June 1995.

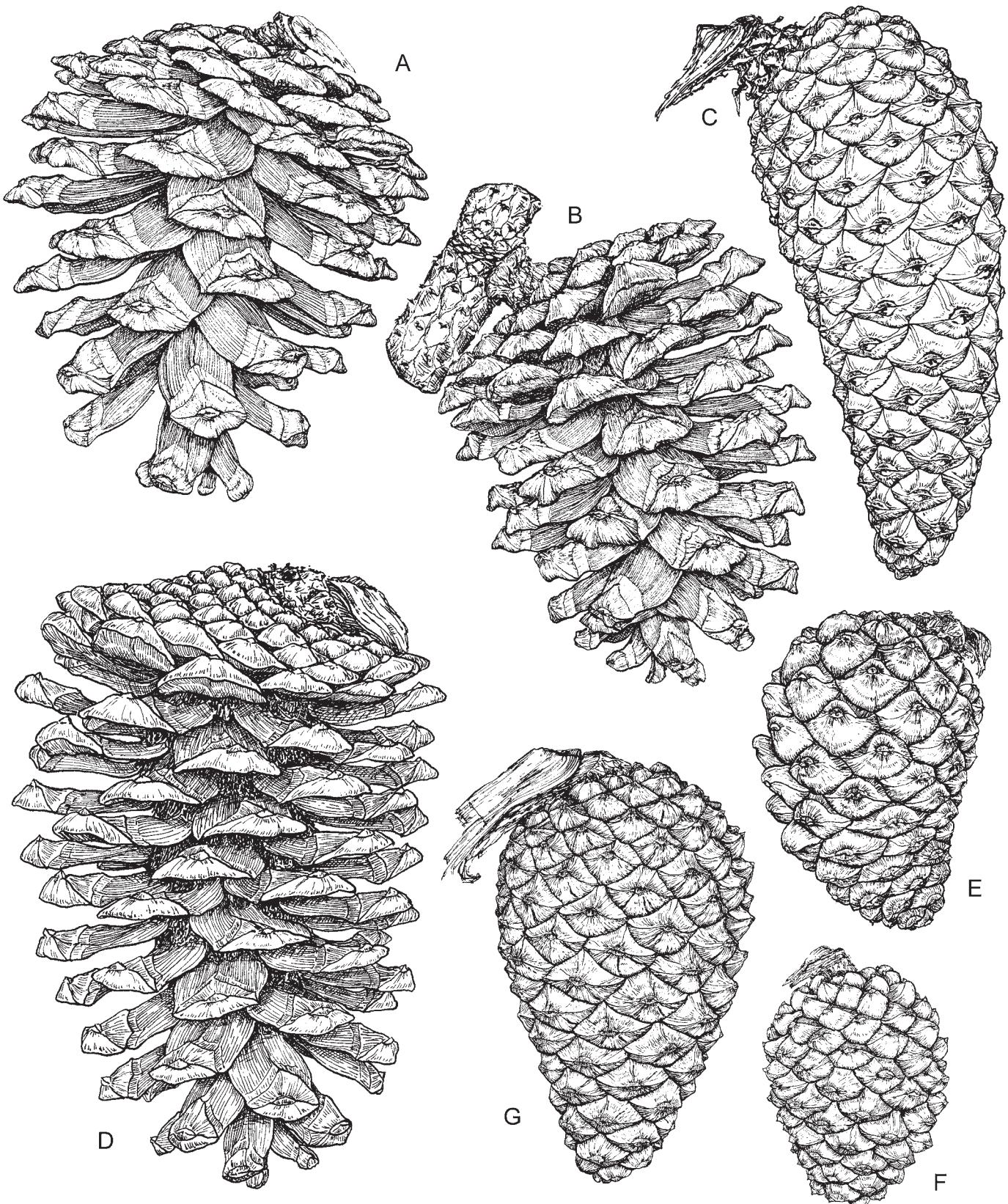


Fig. 33. A–C: *Pinus kesiya* Royle ex Gordon – (A) above SW suburbs of Shillong, East Khasi Hills district, Meghalaya, India; alt. 1600 m; R.B., May 2004; (B) W of the pass betw. Talubin and Barlig, Mountain Prov., Cordillera Central Mts., Luzon, Philippines; alt. 1900 m; R.B., Apr. 2000; (C) Dalat env., Lam Dong Prov., Vietnam; alt. 1420 m; R.B., Nov. 1986. D: *P. yunnanensis* Franch. – Tiger Leap Gorge in Jinsha Jiang (Yangtze River) valley at S foot of the Haba Shan Mts., Zhongdian Co., NW Yunnan, China; alt. 2300 m; R.B., July 1990. E: *P. densata* Mast. var. *densata* – W slopes of Lancang Jiang (Mekong River) valley S of Deqen, NW Yunnan, China; alt. 3100 m; R.B., May 1999. F: *P. densata* subsp. *densata* var. *pygmaea* J. R. Xue – N part of the Yao Shan Mts., Qiaojia Co., NE Yunnan, China; alt. 2800 m; R.B., July 1998. G: *P. densata* subsp. *tibetica* Businský – the type specimen from lower Lang Ho valley NE of Dongjug, Nyingtri Co. and Prefect., Xizang, China; alt. 2300 m; R.B., July 1992.

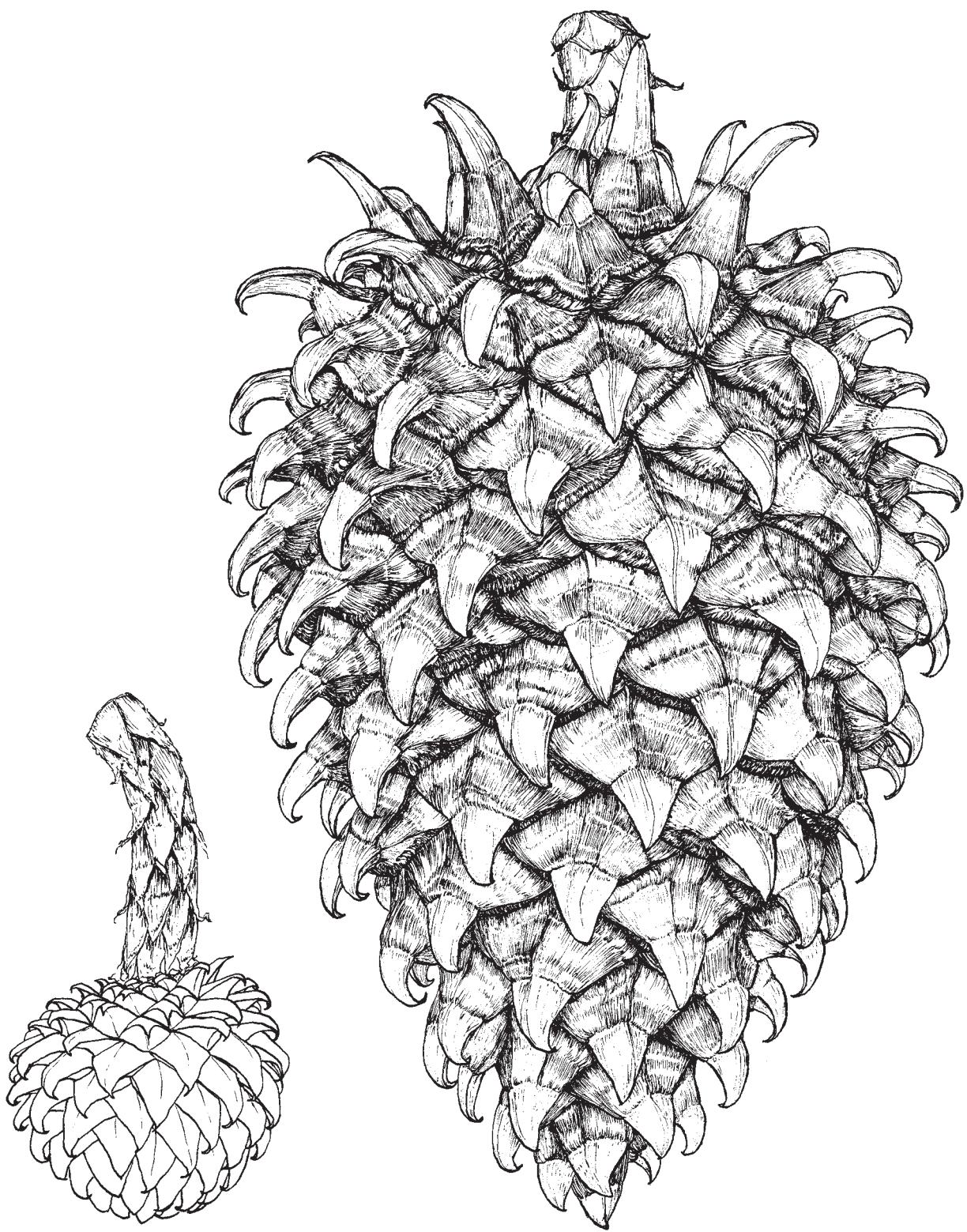


Fig. 34. *Pinus sabineana* Douglas ex D. Don – Folly Arboretum, Ábrahámhegy – Badacsonyörs, Hungary; R.B., Oct. 1983; conelet and newly mature cone of planted tree.



Fig. 35. *Pinus sabineana* Douglas ex D. Don – Moccasin,
Tuolumne Co., California, USA; coll. M. Kučera, Oct. 1984.

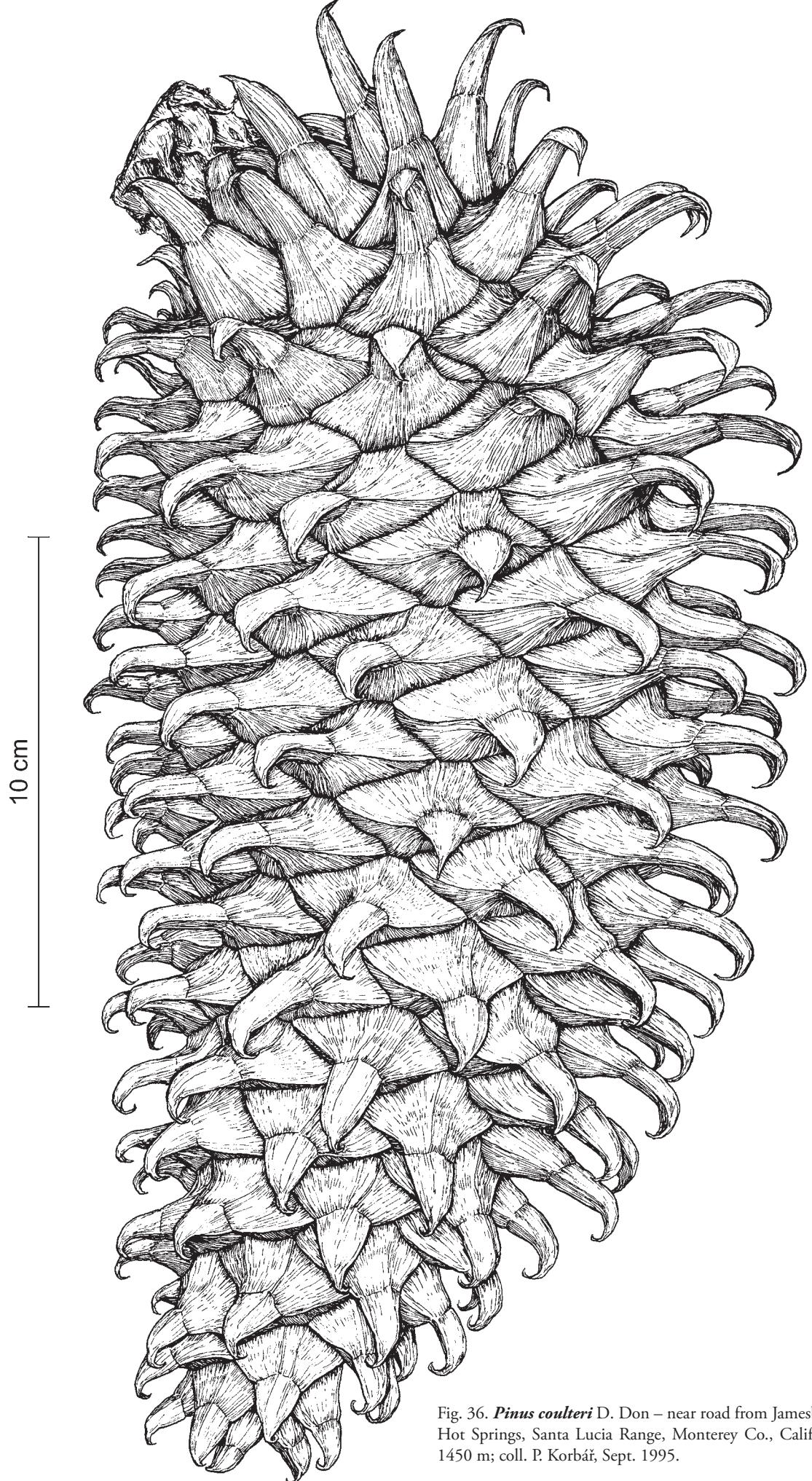


Fig. 36. *Pinus coulteri* D. Don – near road from Jamesburg to Tassajara Hot Springs, Santa Lucia Range, Monterey Co., California, USA; alt. 1450 m; coll. P. Korbář, Sept. 1995.

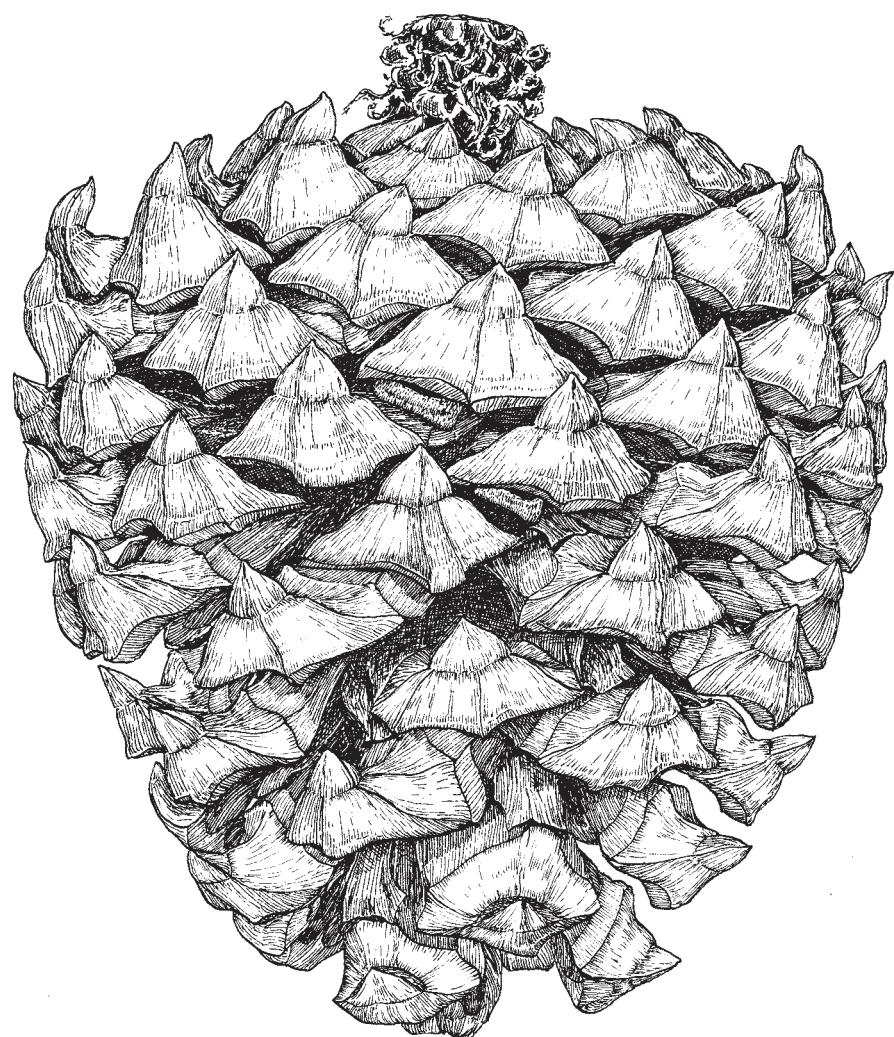


Fig. 37. *Pinus torreyana* Parry ex Carrière var. *torreyana* – Torrey Pines St. Res., San Diego Co., California, USA; coll. Schaeffer, 1985.

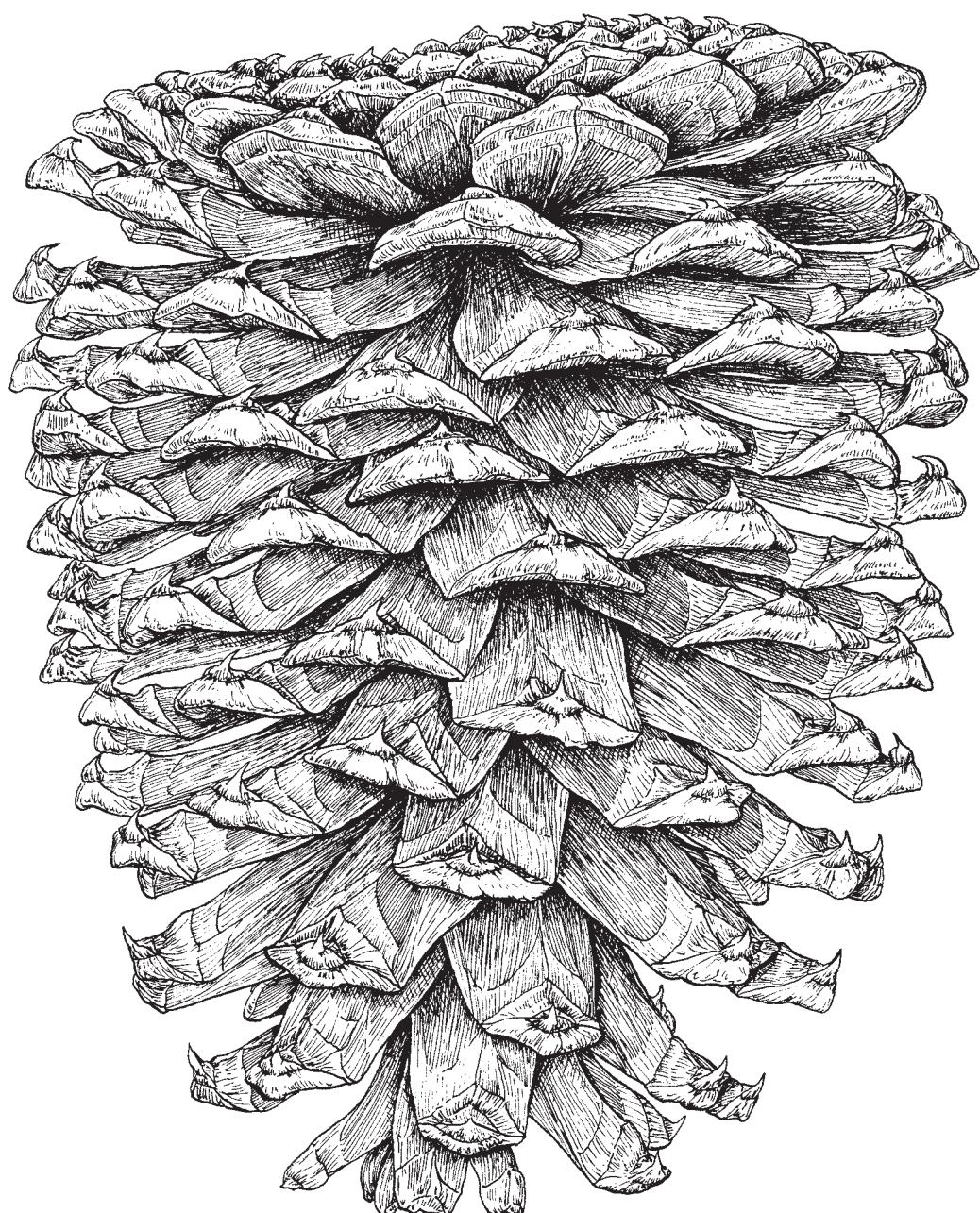


Fig. 38. *Pinus jeffreyi* Balf. – castle park at Kroměříž, S Moravia, Czech Rep.; R.B., Oct. 1983; planted tree.

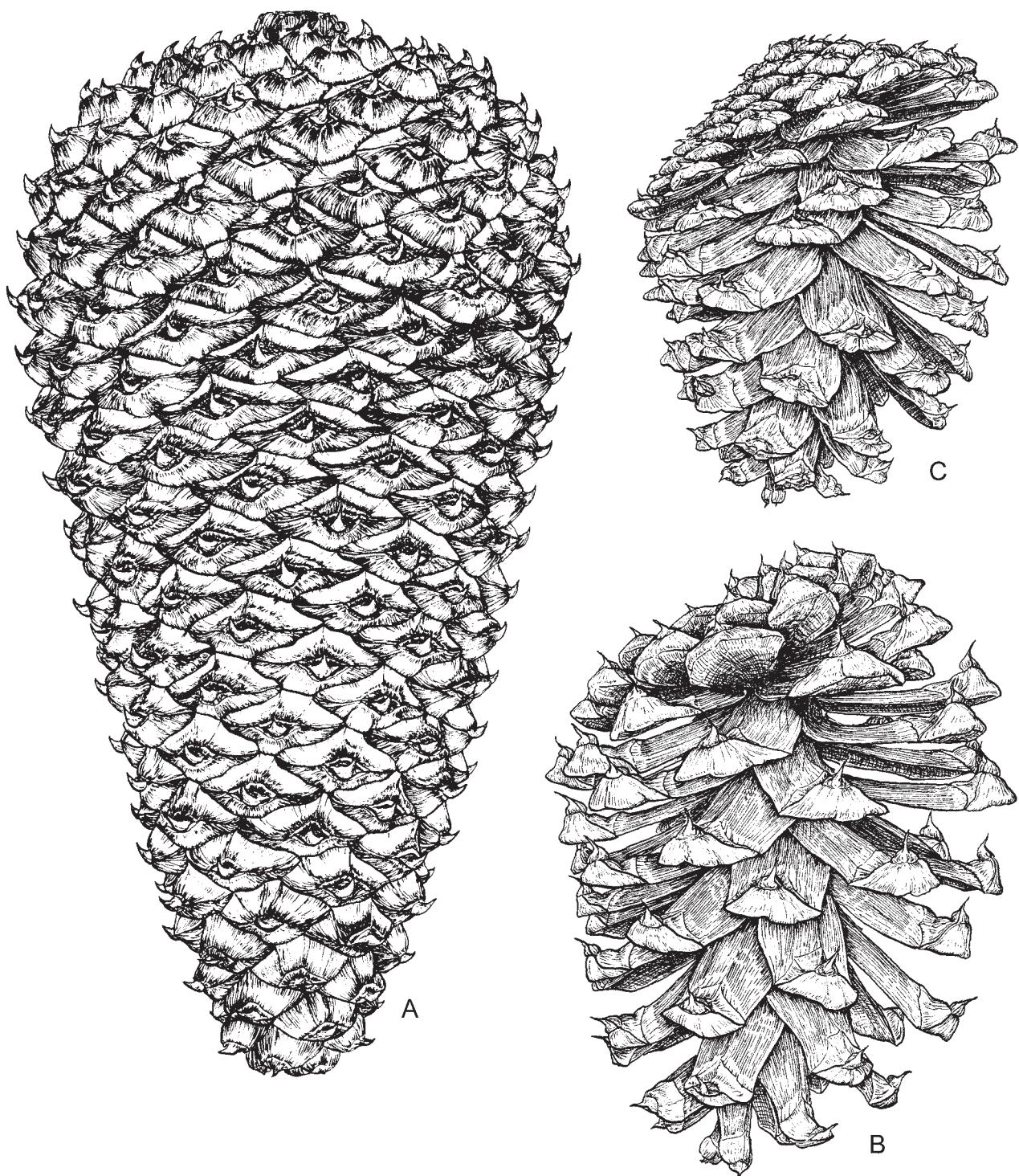


Fig. 39. A: *Pinus jeffreyi* Balf. – castle park at Moravec, Žďár nad Sázavou Distr., W Moravia, Czech Rep.; R.B., Sept. 1983; planted tree. B, C: *P. ponderosa* subsp. *scopulorum* (Engelm.) E. Murray var. *scopulorum* – (B) N of Cuba, Sandoval Co., New Mexico, USA; alt. 2200 m; coll. O. R. Fencl, Sept. 2005; (C) Mlyňany Arboretum, Nitra Distr., Slovakia; R.B., Feb. 1982; planted tree.

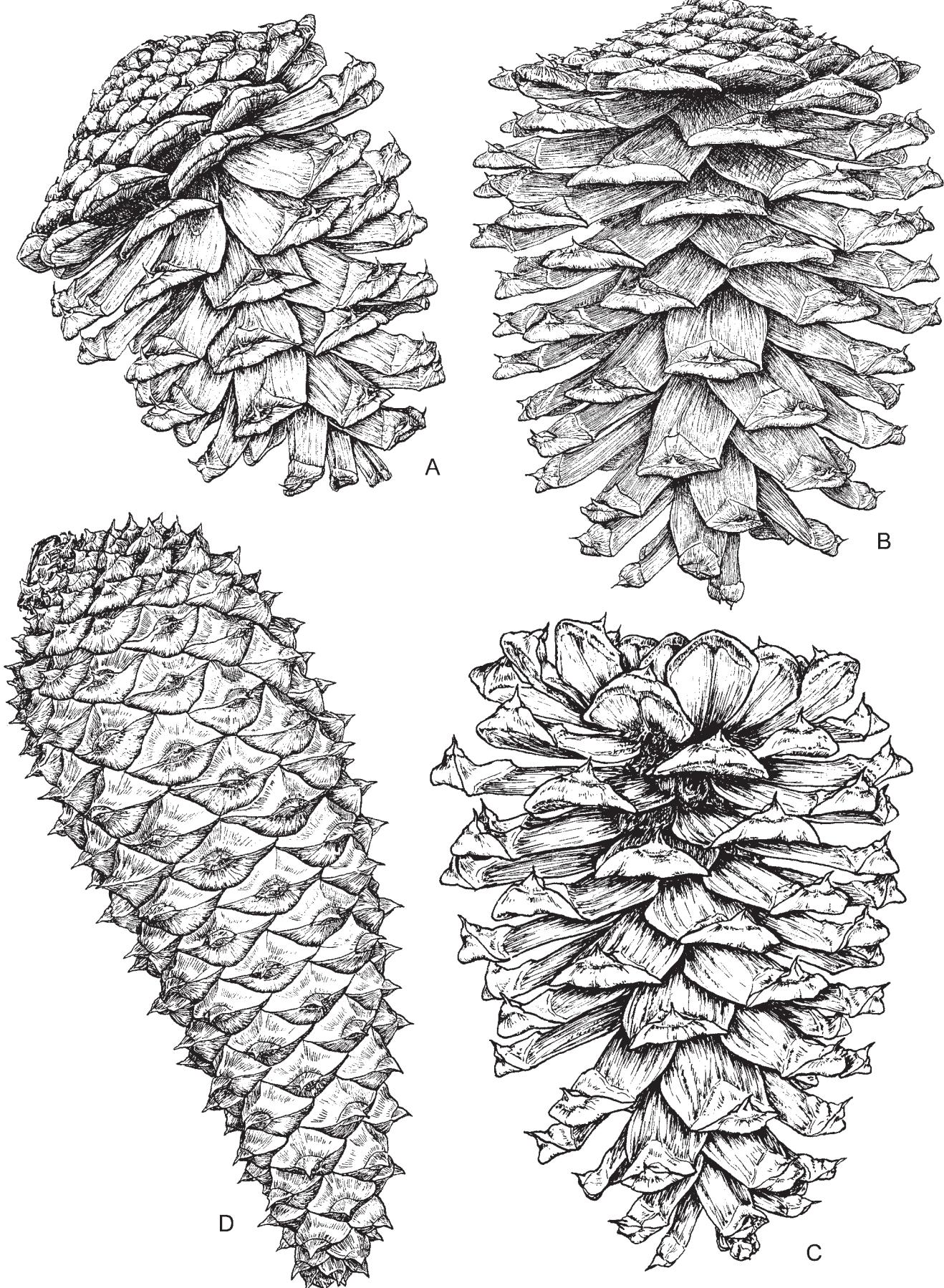


Fig. 40. **A:** *Pinus ponderosa* Douglas ex C. Lawson **var. ponderosa** – Pyšely, Benešov Distr., C Bohemia, Czech Rep.; R.B., Dec. 1984; planted tree. **B–D:** *P. ponderosa* subsp. *ponderosa* **var. benthamiana** (Hartw.) Vasey – (B, C) cones from two trees from the Yosemite Natl. Park, California, USA; alt. 2200 m; coll. M. Kučera, Oct. 1984; (D) castle park at Průhonice near Praha, C Bohemia, Czech Rep.; R.B., Sept. 1983; planted tree.

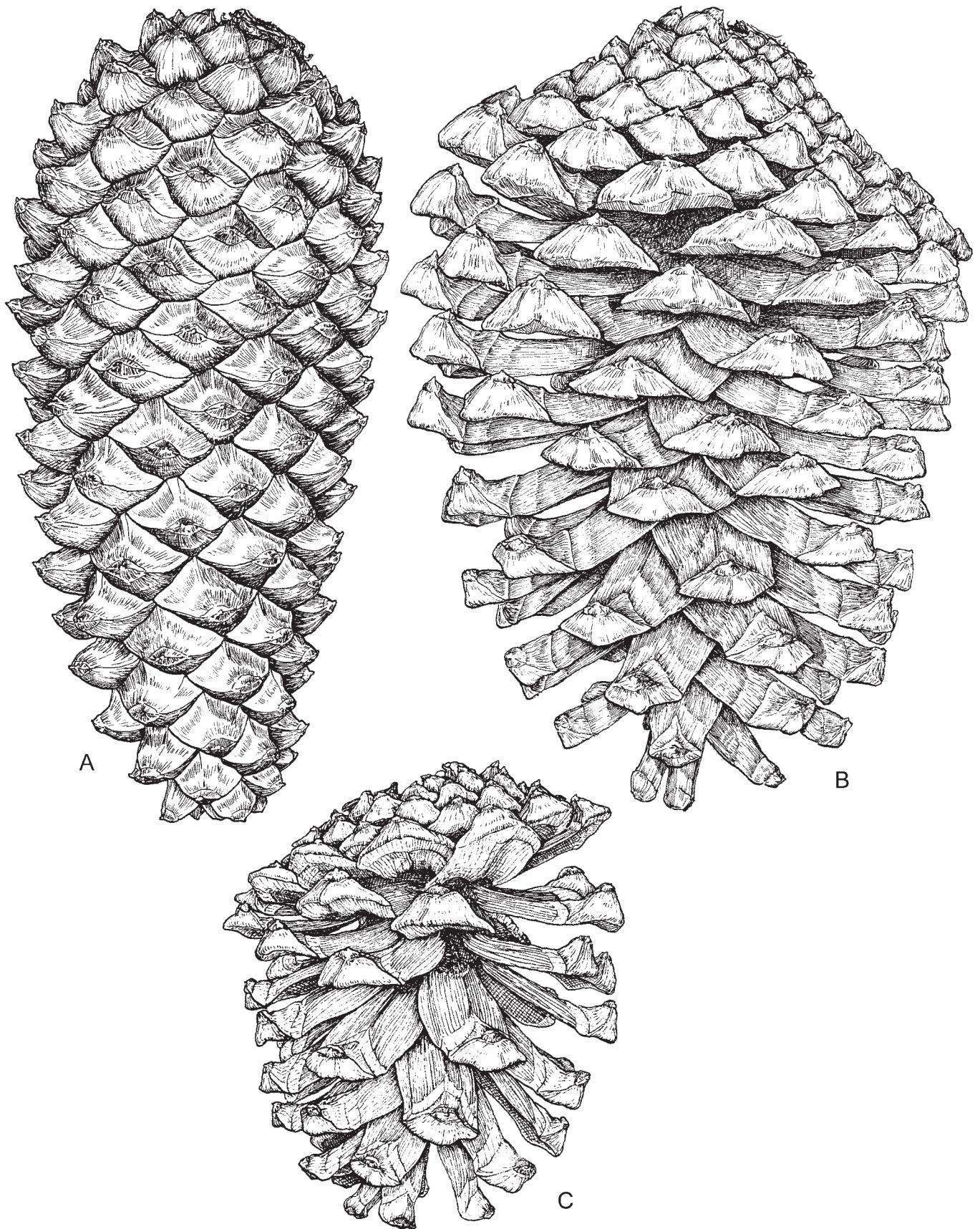


Fig. 41. A, B: *Pinus engelmannii* Carrière – cones from two trees from E env. of Santiago Papasquiaro, Durango, Mexico; alt. ca. 2100 m; coll. M. Kučera, Oct. 1994. C: *P. arizonica* Engelm. – Sierra de Madera, Sonora, Mexico; c.u., 1982.

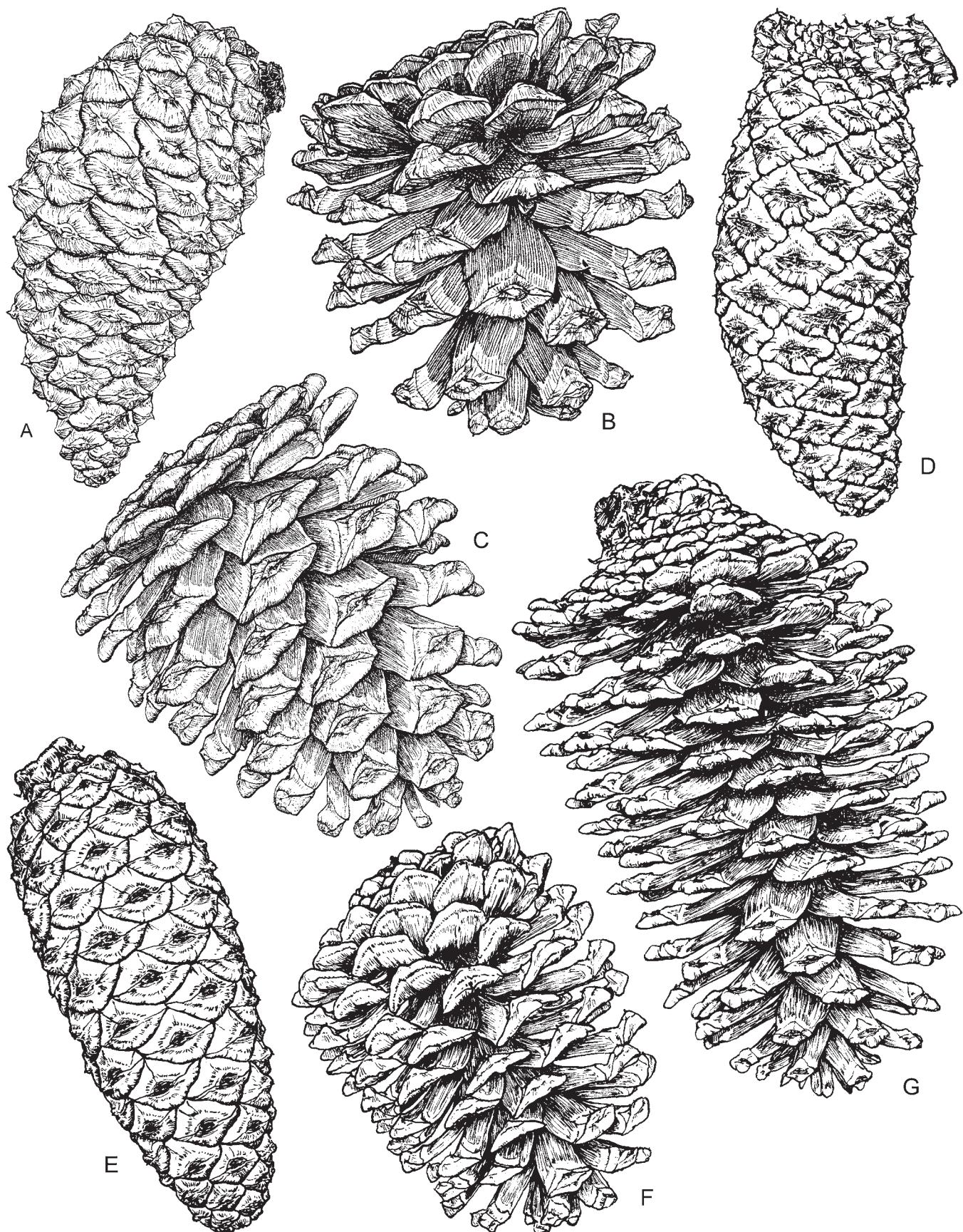


Fig. 42. A, B: *Pinus durangensis* Martínez – (A) Los Lírios, Mpio. de Canatlán, Durango, Mexico; alt. 2640 m; coll. R. B. Trujillo, Jan. 1993; (B) near road MEX 40 SW of El Salto, Durango, Mexico; 2620 m; coll. M. Kučera, Oct. 1994. C: *P. cooperi* C. E. Blanco – near road MEX 23 betw. Morelos and Santiago Papasquiaro, Durango, Mexico; 2100 m; coll. M. Kučera, Oct. 1994. D–G: *P. hartwegii* Lindl. – Zoquiapán Natl. Park, NW side of Volcán Iztaccíhuatl, Estado de México; alt. 3200 m; coll. E. Rincon & J. Dobrý, May 1980; (F) the same data, but alt. 4000 m.

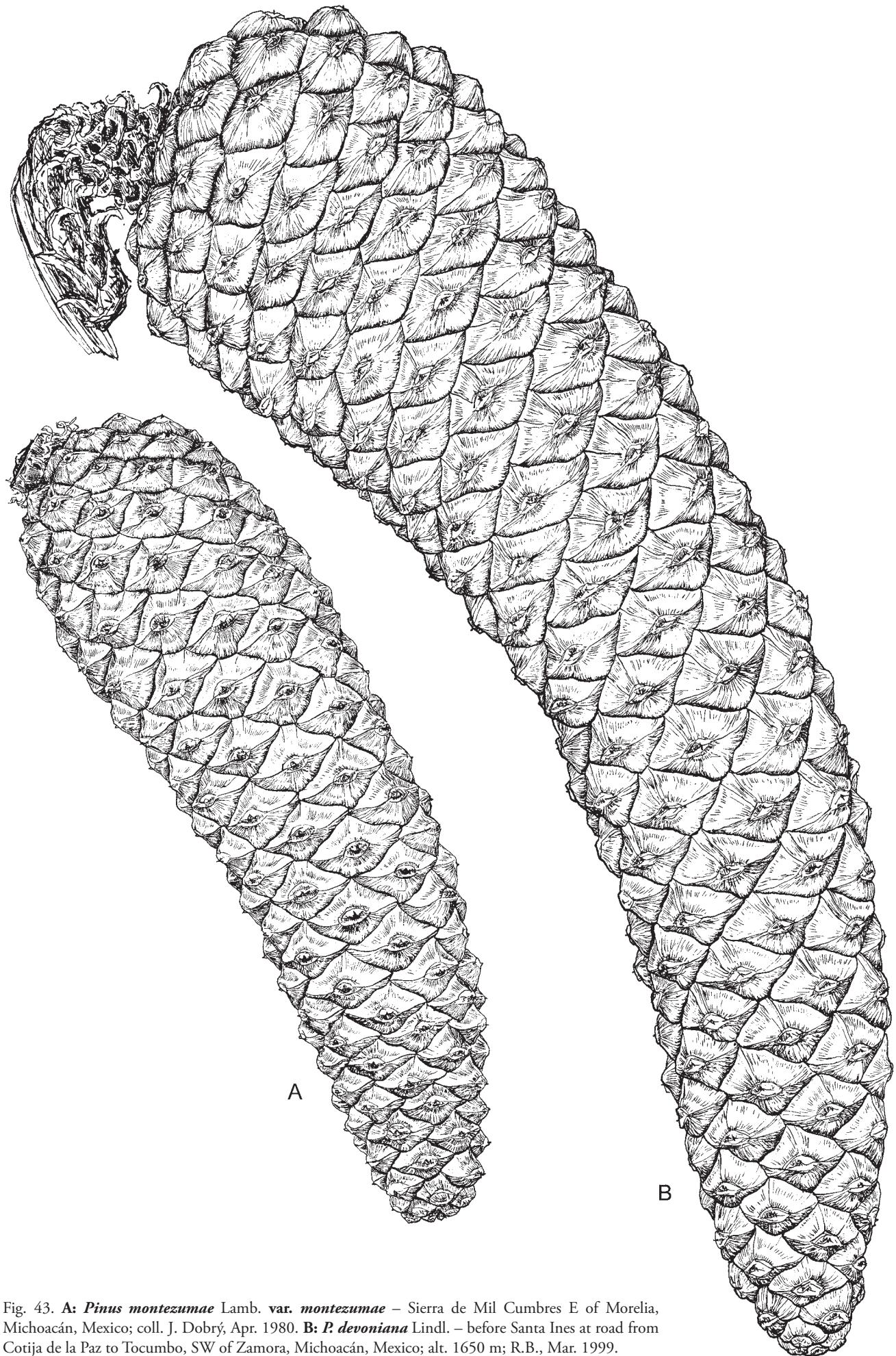


Fig. 43. A: *Pinus montezumae* Lamb. var. *montezumae* – Sierra de Mil Cumbres E of Morelia, Michoacán, Mexico; coll. J. Dobrý, Apr. 1980. B: *P. devoniana* Lindl. – before Santa Ines at road from Cotija de la Paz to Tocumbo, SW of Zamora, Michoacán, Mexico; alt. 1650 m; R.B., Mar. 1999.

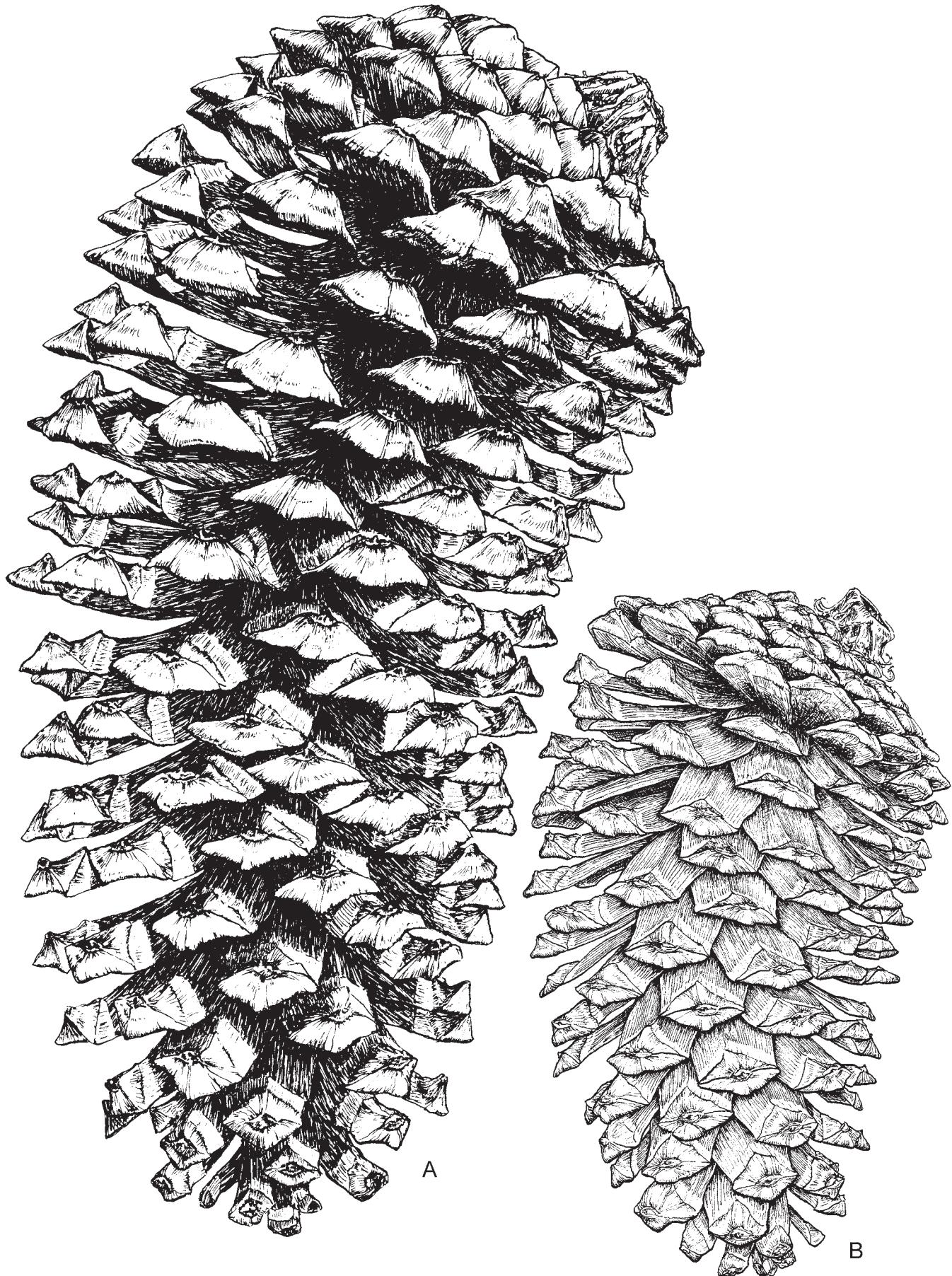


Fig. 44. A: *Pinus devoniana* Lindl. – San Jerónimo Coatlán, Sierra de Miahuatlán, Oaxaca, Mexico; coll. J. Dobrý, Apr. 1980. B: *P. montezumae* Lamb. var. *montezumae* – E of Paso de Cortés, Puebla, Mexico; alt. 3100 m; R.B., Feb. 2007.

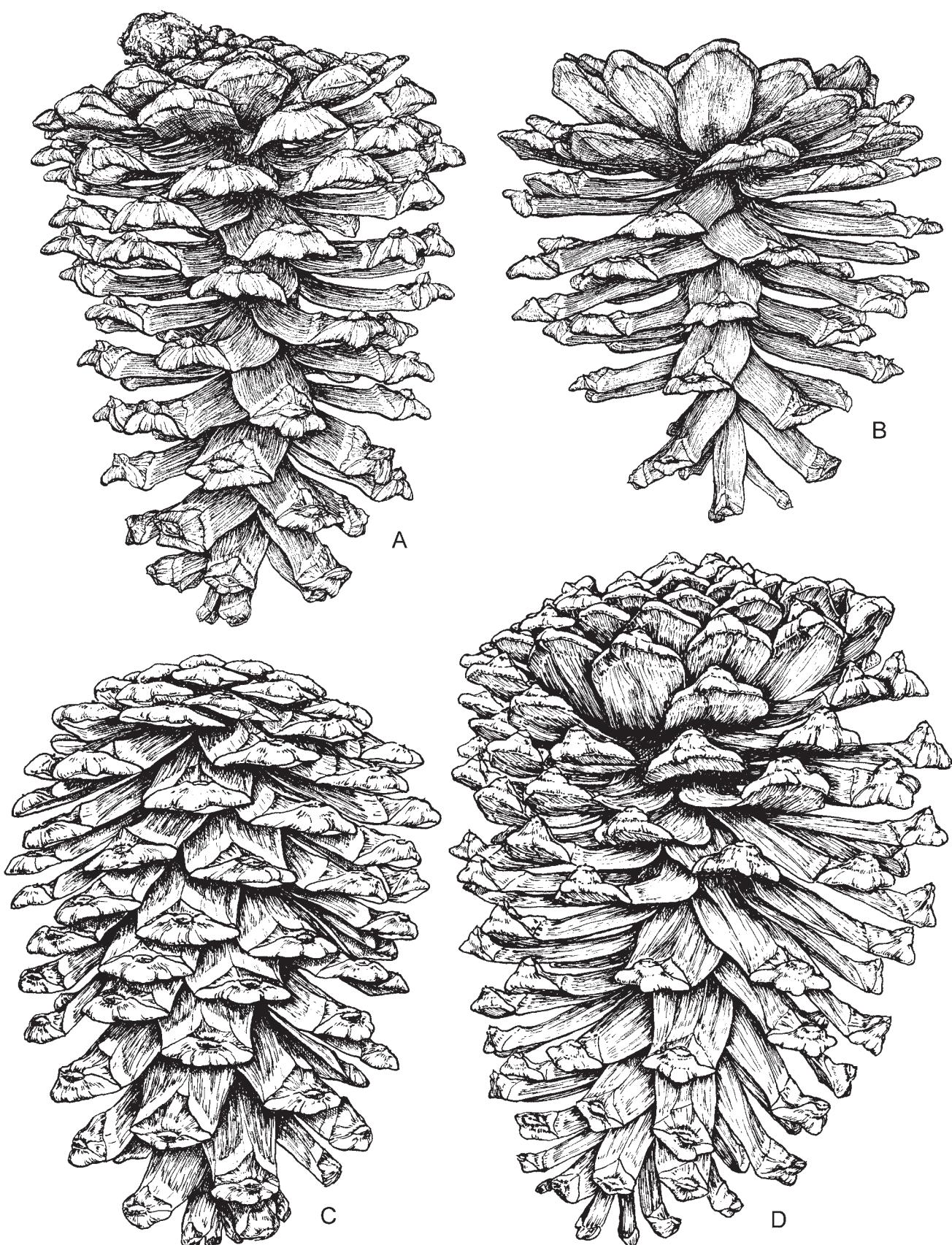


Fig. 45. **A:** *Pinus douglasiana* Martínez – plateau NE of Cerro Chiqueritas, Dos Aguas, Coalcomán de Matamoros, Sierra Madre del Sur, Michoacán, Mexico; alt. 2350 m; R.B., Mar. 1999. **B:** *P. maximinoi* H. E. Moore – Santo Domingo Coatlán, Sierra de Miahuatlán, Oaxaca, Mexico; coll. J. Dobrý, Apr. 1980. **C, D:** *P. pseudostrobus* Lindl. var. *pseudostrobus* – (C) Sierra de Mil Cumbres E of Morelia, Michoacán, Mexico; coll. J. Dobrý, Apr. 1980; (D) above Amecameca, Estado de México; c.u., 1982.

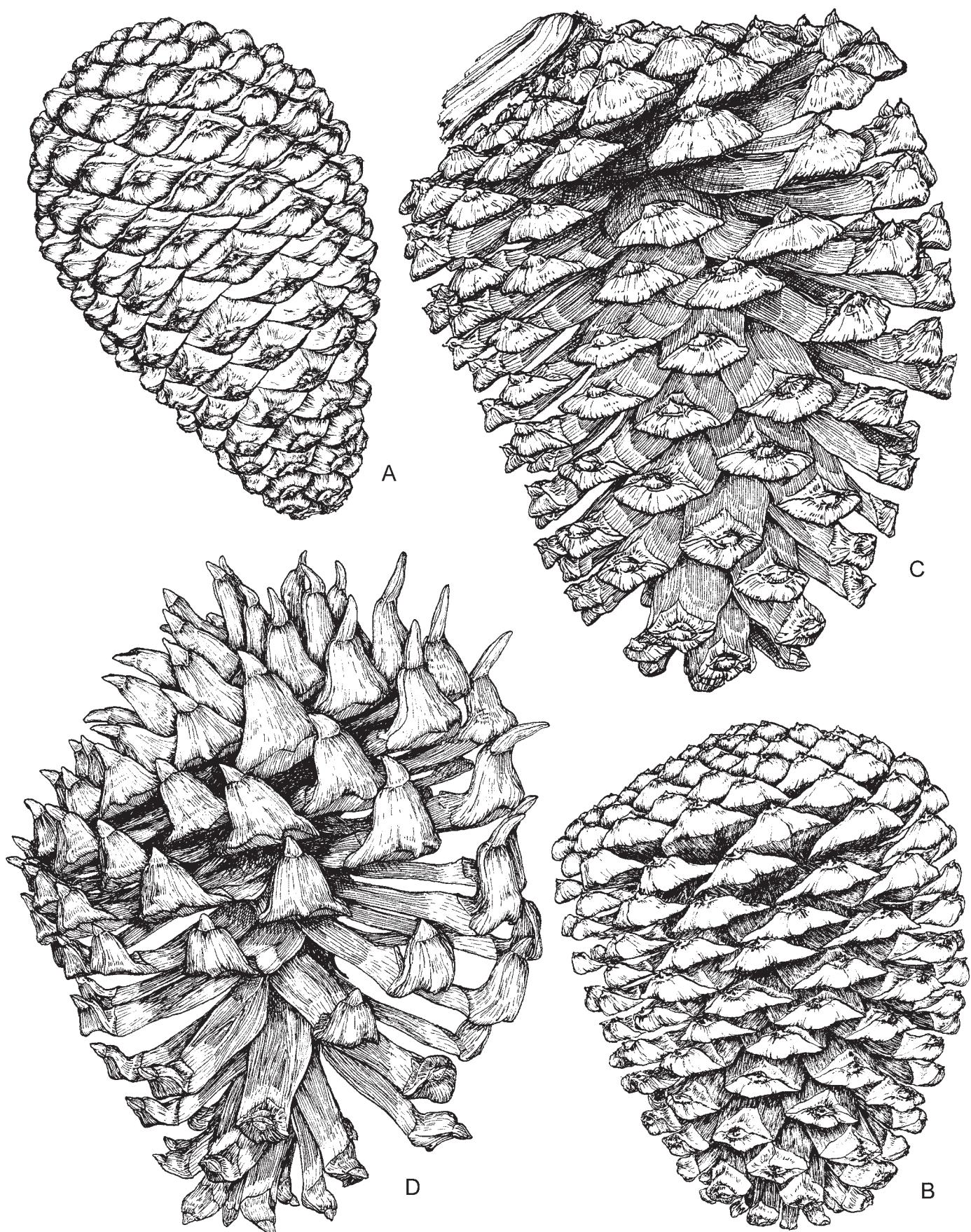


Fig. 46. A, B: *Pinus pseudostrobus* Lindl. var. *pseudostrobus* – cones from one tree from Volcán Popocatépetl, Mexico; coll. J. Haager, Feb. 1977. C: *P. pseudostrobus* var. *estevezii* Martínez – east foot of Cerro Potosí, Galeana, Nuevo León, Mexico; alt. 2130 m; R.B., Feb. 2007. D: *P. pseudostrobus* var. *apulcensis* (Lindl.) Shaw – Santo Domingo Coatlán, Sierra de Miahualtán, Oaxaca, Mexico; coll. E. Rincon & J. Dobrý, Apr. 1980.

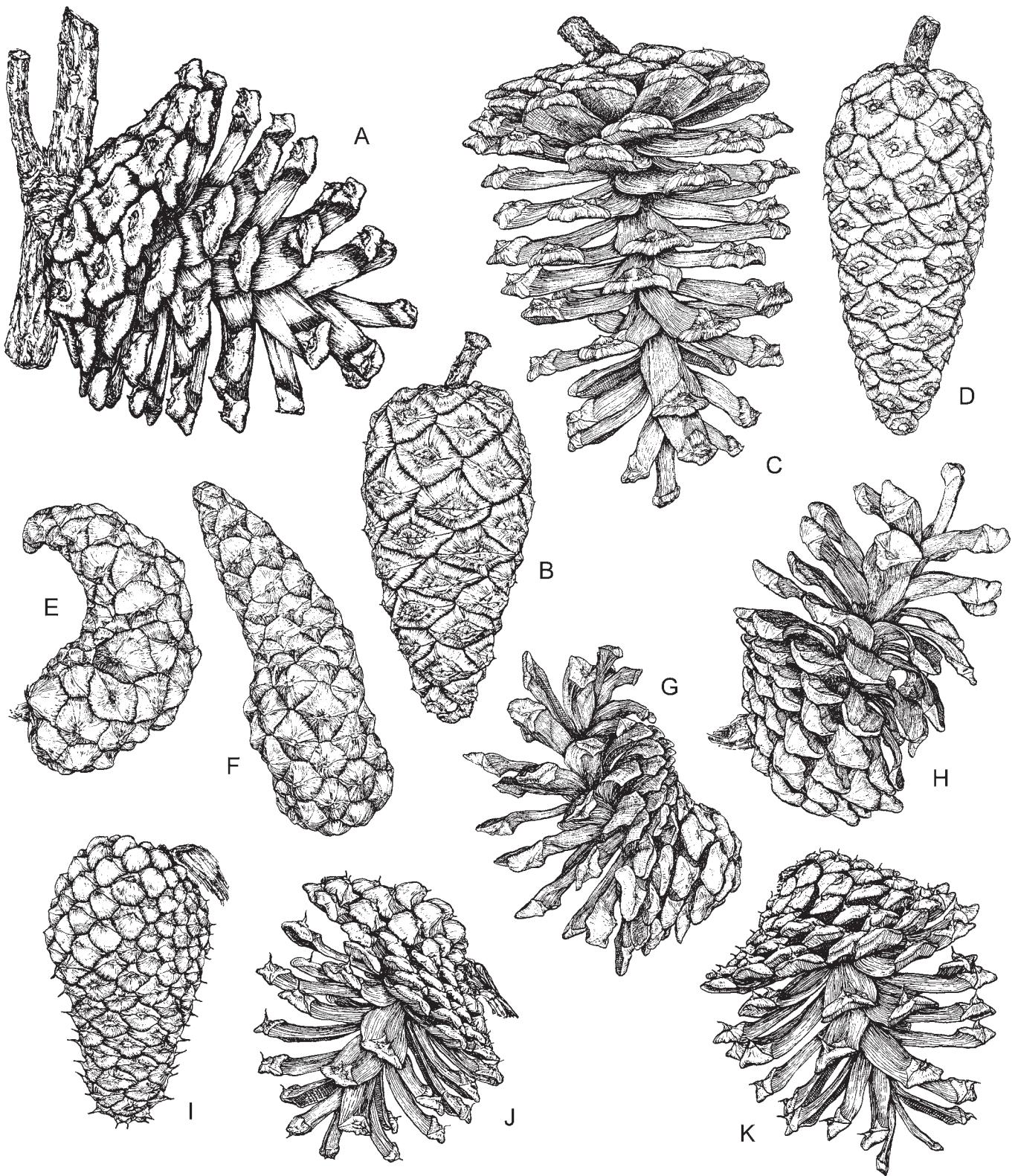


Fig. 47. **A:** *Pinus leiophylla* Schiede ex Schltdl. et Cham. var. *leiophylla* – above Amecameca, Estado de México; c.u., 1982. **B:** *P. leiophylla* var. *chihuahuana* (Engelm.) Shaw – near Cerocahui, Barranca del Cobre N.P., Sierra Madre Occidental, Chihuahua, Mexico; alt. 1900 m; coll. B. Březina, Feb. 1998. **C, D:** *P. lambertii* B. L. Rob. et Fernald – (C) top of road from Jalpa to Tlaltenango de Sánchez Román, Sierra de Morones, Zacatecas, Mexico; alt. 2450 m; R.B., Feb. 1999; (D) NW of Monte Escobedo, Zacatecas, near border of Jalisco; alt. 2380 m; R.B., Feb. 2007. **E-H:** *P. banksiana* Lamb. – (E) Whitecourt, Alberta, Canada; alt. 700 m; c.u., before 1966; (F) castle park at Průhonice near Praha, C Bohemia, Czech Rep.; R.B., Dec. 1981; planted tree; (G) Turtle Creek S of Moncton, New Brunswick, Canada; alt. 250 m; c.u., before 1966; (H) Borová hora Arboretum, Zvolen, Slovakia, Aug. 1986. **I, J:** *P. contorta* Douglas ex Loudon subsp. *latifolia* (Engelm.) Critchf. – Hora Svatého Šebestiána, Krušné hory Mts., Chomutov Distr., W Bohemia, Czech Rep.; alt. 835 m; R.B., June 1986; experimental plantation. **K:** *P. contorta* subsp. *murrayana* (Balf.) Engelm. – Deadman Creek, Mammoth Lakes, Mono Co., California, USA; alt. 2450 m; coll. J. Riba, Oct. 1995.

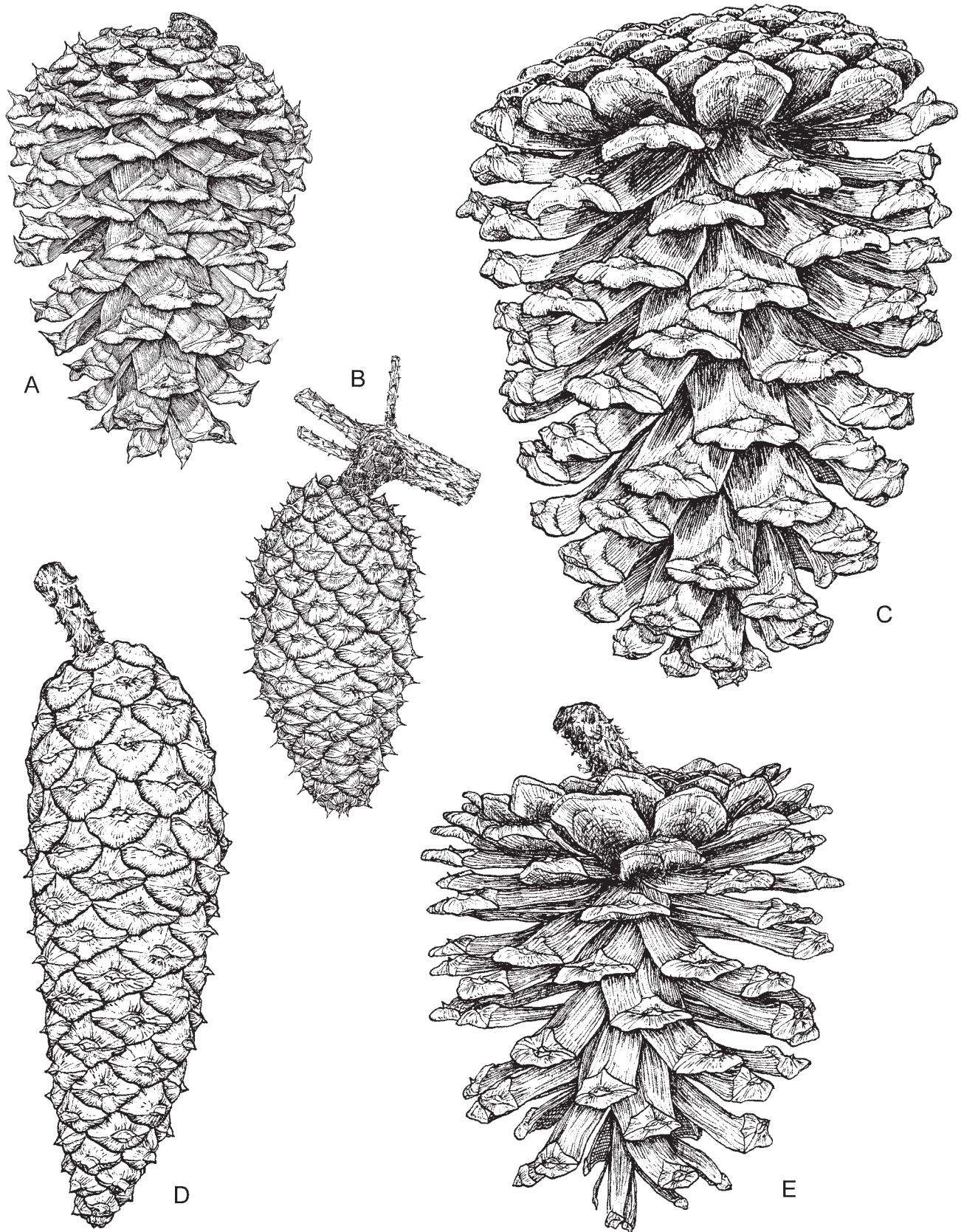


Fig. 48. **A:** *Pinus virginiana* Mill. – Prince Georges Co., Maryland, USA; c.u., before 1962. **B:** *P. clausa* (Chapm. ex Engelm.) Sarg. – Eustis, Lake Co., Florida, USA; coll. G. V. Nash, July 1895. **C:** *P. elliottii* Engelm. *subsp. elliottii* – Ochlockonee River State Park, Apalachicola Nat. For. region, Wakulla Co., Florida, USA; near the sea level; coll. Josef Tichý, Oct. 1992. **D, E:** *P. caribaea* Morelet *var. caribaea* – (D) Topes de Collantes, Sancti Spíritus Prov., Cuba; alt. ca. 750 m; coll. J. Komárek, Oct. 1987; plantation; (E) Viñales, Pinar del Rio Prov., Cuba; alt. ca. 400 m; c.u.; the 1980s.

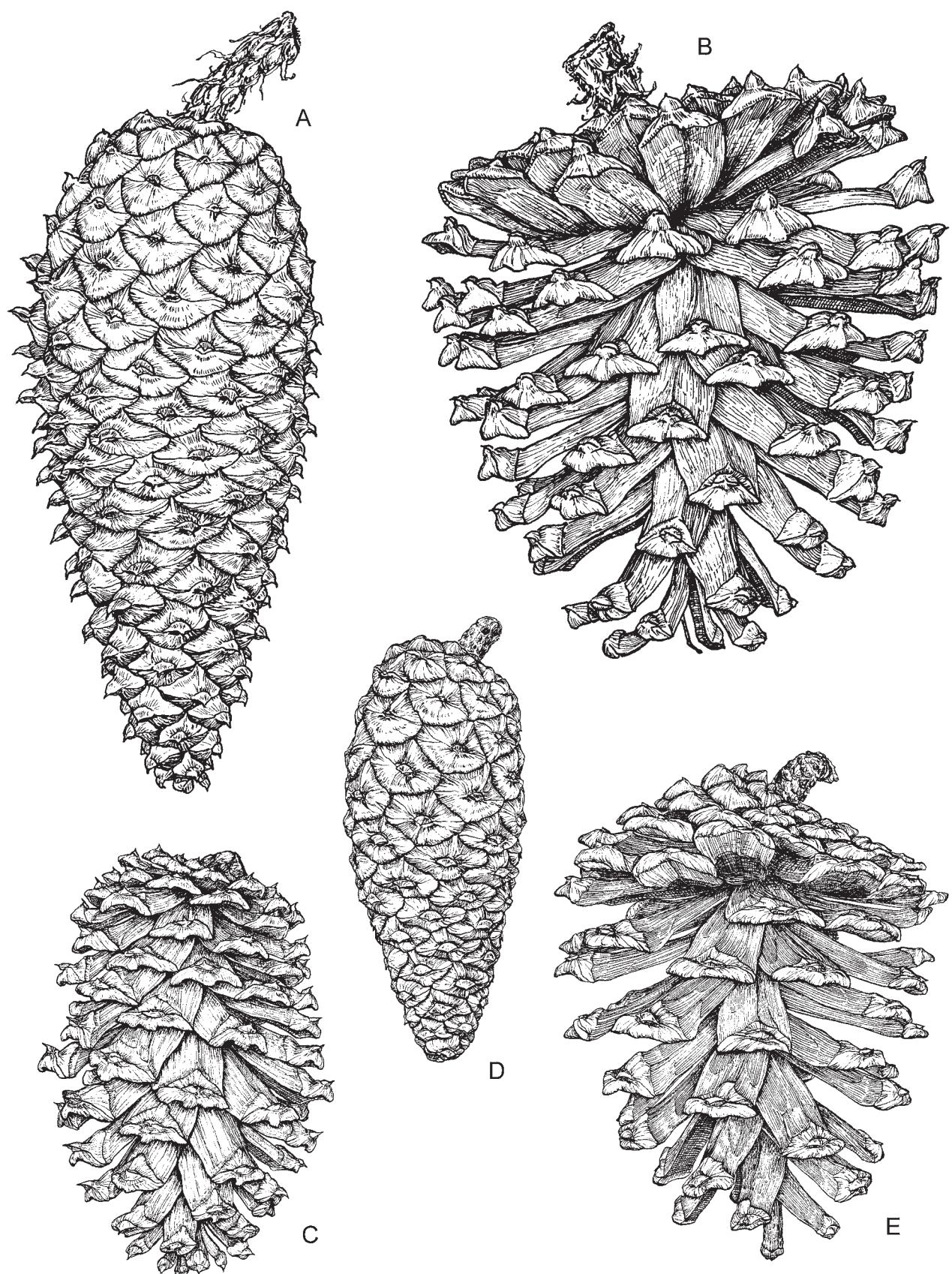


Fig. 49. **A, B:** *Pinus hondurensis* Sénécl. – (A) Trueté, Ile des Pins, New Caledonia; alt. 35 m; R.B., Apr. 1994; plantation; (B) north foothills of Maya Mts. ca 12 km SE of El Cayo, Belize; coll. O. R. Fencl, June 2005. **C:** *P. occidentalis* Sw. – Dominican Republic, Hispaniola; c.u., 1971. **D, E:** *P. cubensis* Griseb. – two cones from the Sierra de Nipe above Mayarí, Holguín Prov., Cuba; c.u., 1987.

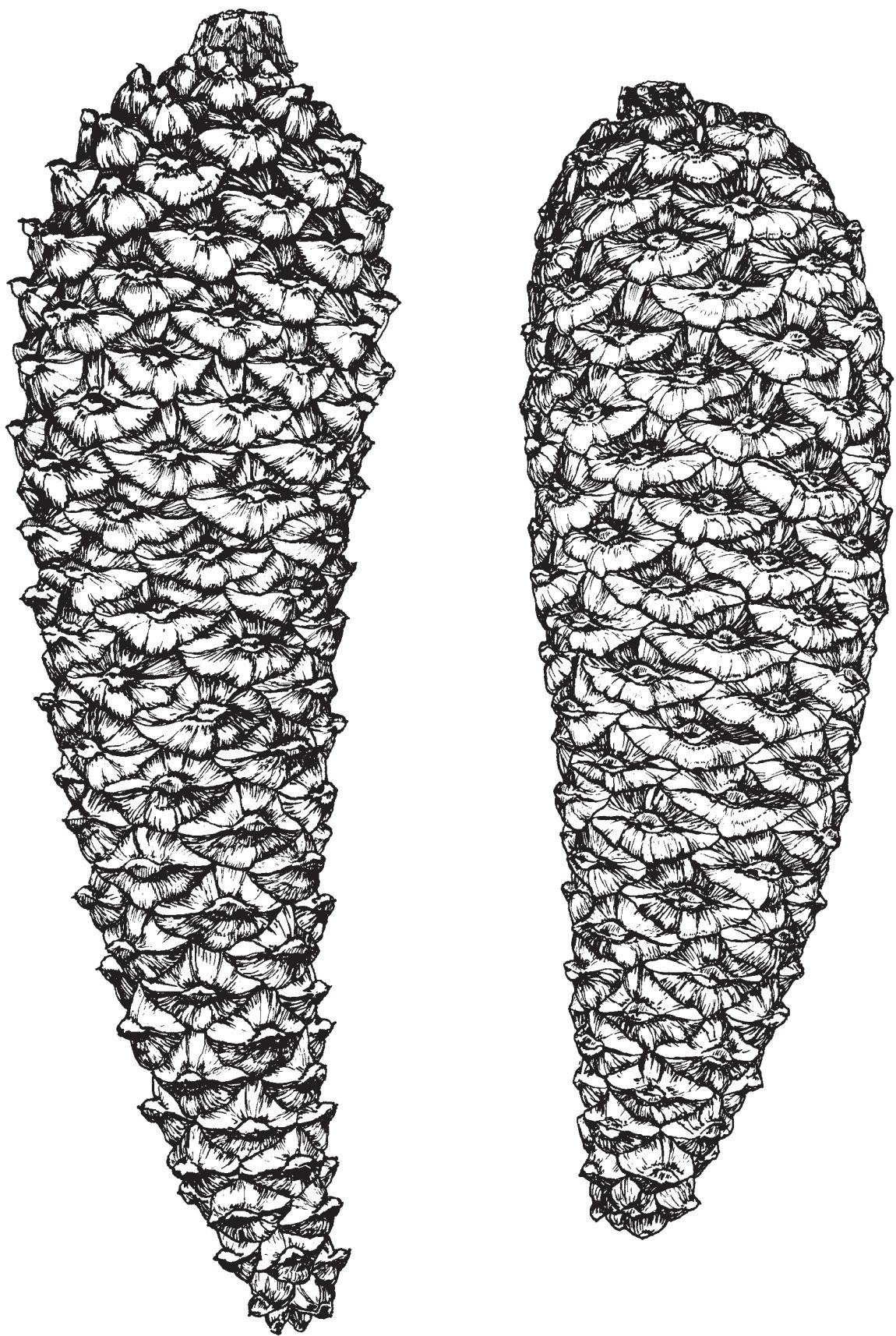


Fig. 50. *Pinus palustris* Mill. – cones from two trees from Clemson, Oconee Co., Georgia, USA; coll. R. E. Schoenike, Oct. 1980; plantation.

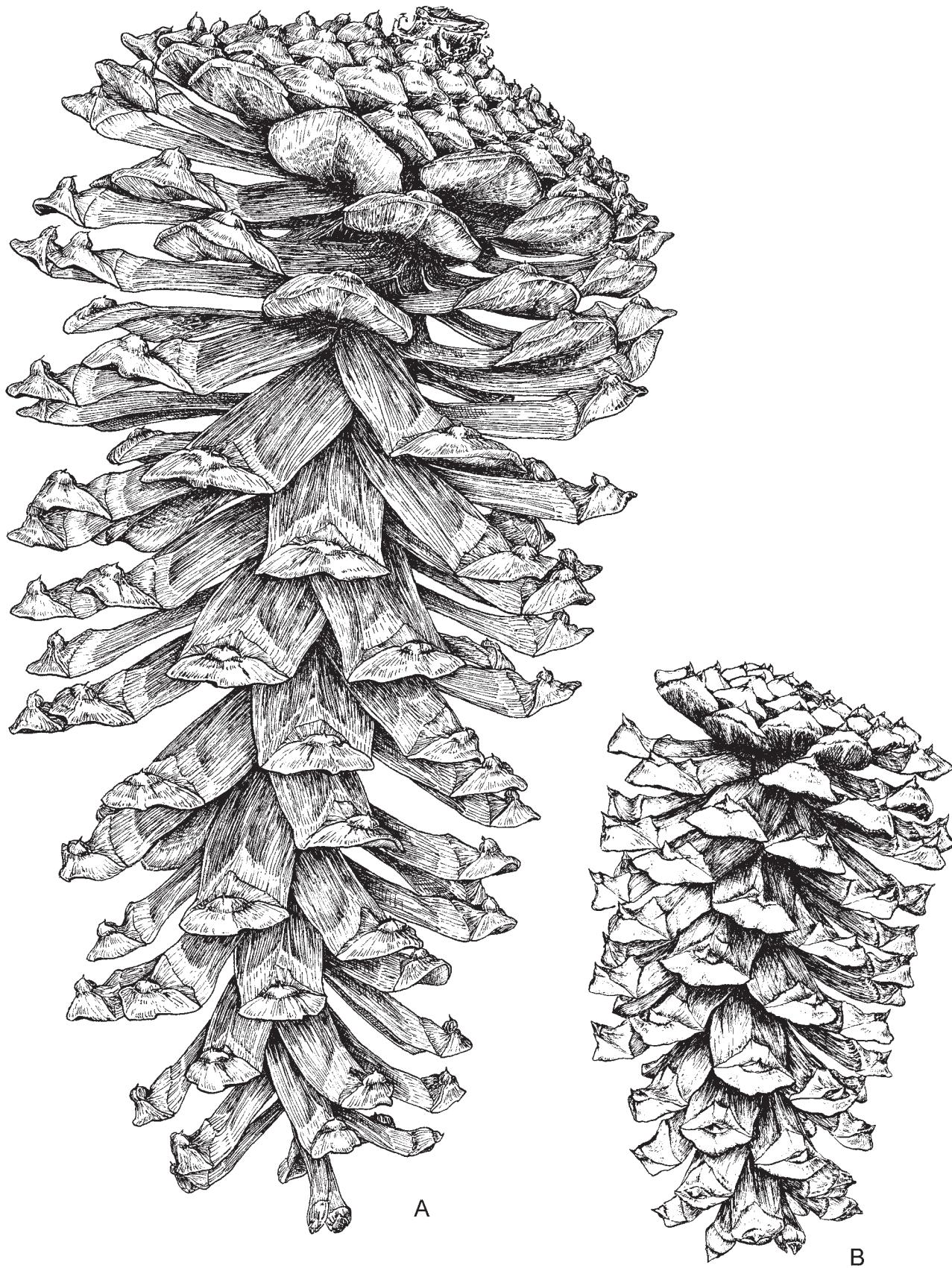


Fig. 51. A: *Pinus palustris* Mill. – Clemson, Oconee Co., Georgia, USA; coll. R. E. Schoenike, Oct. 1980; plantation. B: *P. taeda* L. – Kobuleti, NE of Batumi, Gruziya; coll. M. Kučera, June 1982; experimental plantation.

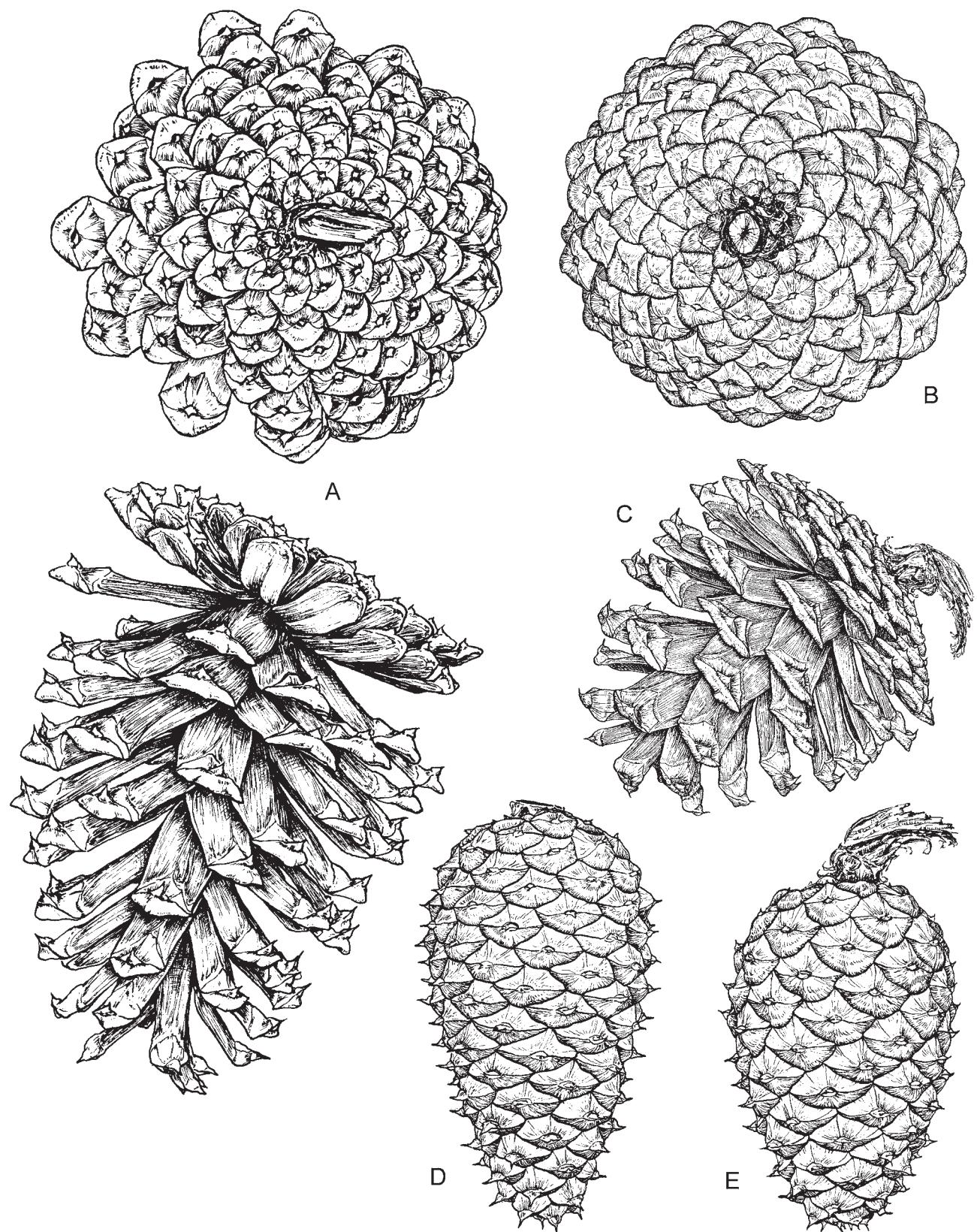


Fig. 52. **A:** *Pinus taeda* L. – two views on the same cone: ca. 11 km NE of Arkadelphia, Clark Co., Arkansas, USA; coll. R. C. Friesner. **B–E:** *Pinus rigida* Mill. – (B) Peklov Arboretum, Kostelec nad Černými Lesy, Kolín Distr., C Bohemia, Czech Rep.; R.B., Jan. 1984; planted tree; (C) York Co., Maine, USA; alt. 60 m; c.u., before 1962; (D, E) Pygmy Forest Res., Forked River, Ocean Co., New Jersey, USA; alt. 10 m; coll. M. Kučera, Oct. 1990.

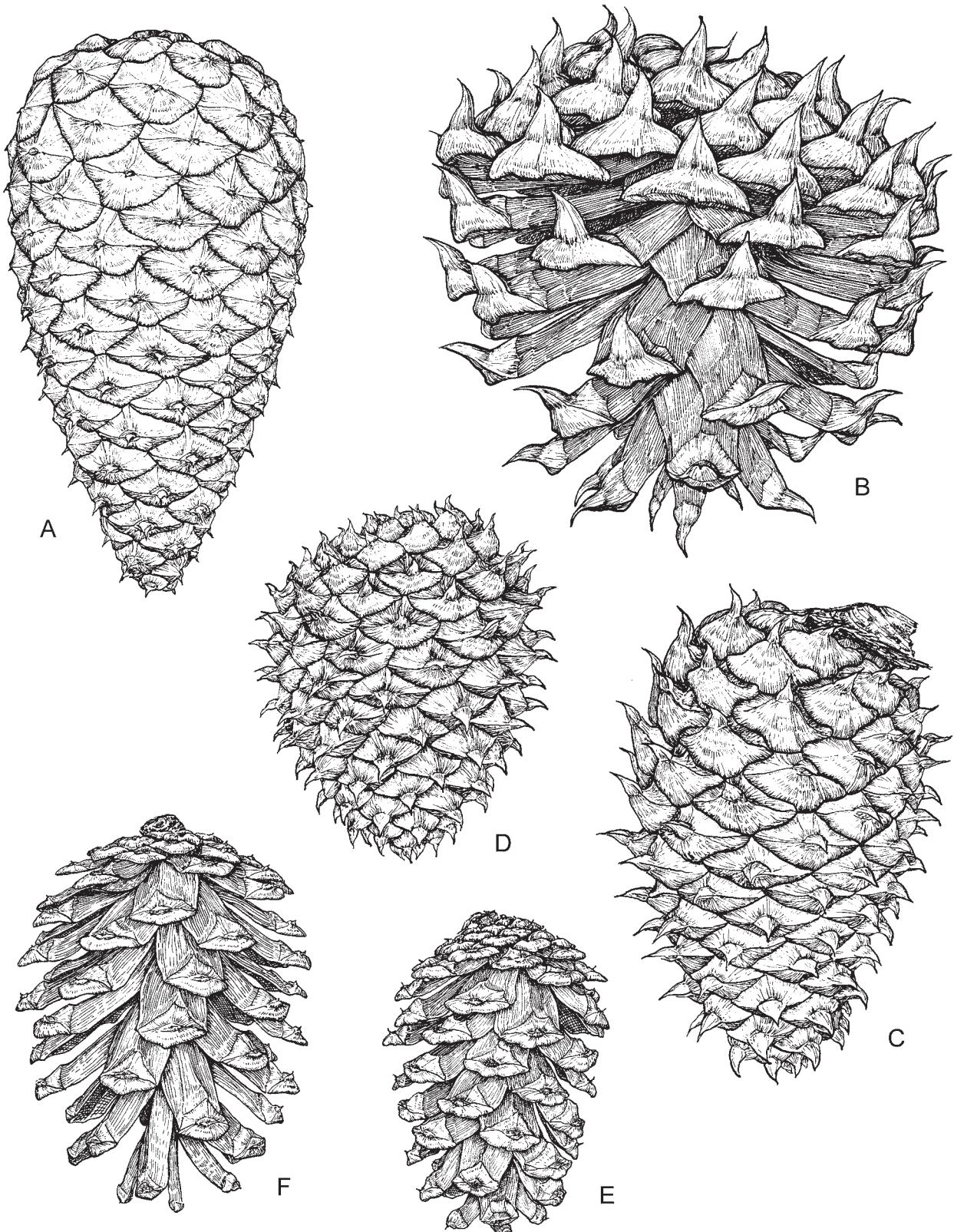


Fig. 53. A: *Pinus serotina* Michx. – Coastal Plain, North Carolina, USA; coll. R. R. Braham, Oct. 1988. B-D: *P. pungens* Lamb. – (B, C) Sofronka Arboretum, Bolevec near Plzeň, W Bohemia, Czech Rep.; R.B., Feb. 1990; experimental plantation; (D) Great Smoky Mts., Sevier Co., E Tennessee, USA; coll. R. C. Friesner. E: *P. echinata* Mill. – ca. 11 km NE of Arkadelphia, Clark Co., Arkansas, USA; coll. R. C. Friesner. F: *P. glabra* Walter – Harrison Co., S Mississippi, USA; c.u., 1968.

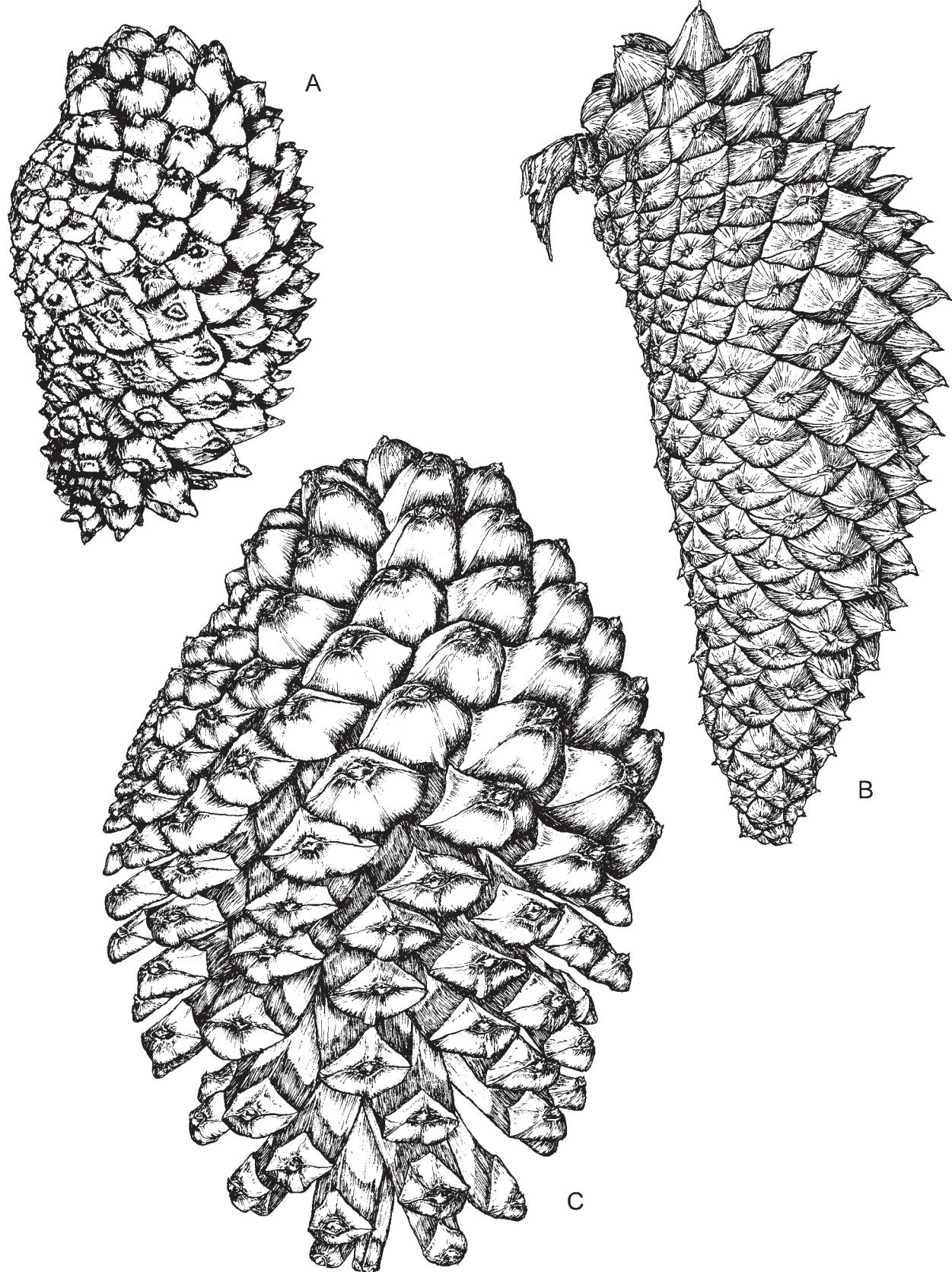


Fig. 54. **A:** *Pinus muricata* D. Don – Washington, D.C., USA; c.u., 1963; planted tree. **B:** *P. attenuata* Lemmon – Washington, D.C., USA; c.u., 1963; planted tree. **C:** *P. radiata* D. Don var. *radiata* – Black Sea coast at Kiten, SE Bulgaria; R.B., Sept. 1985; planted tree.

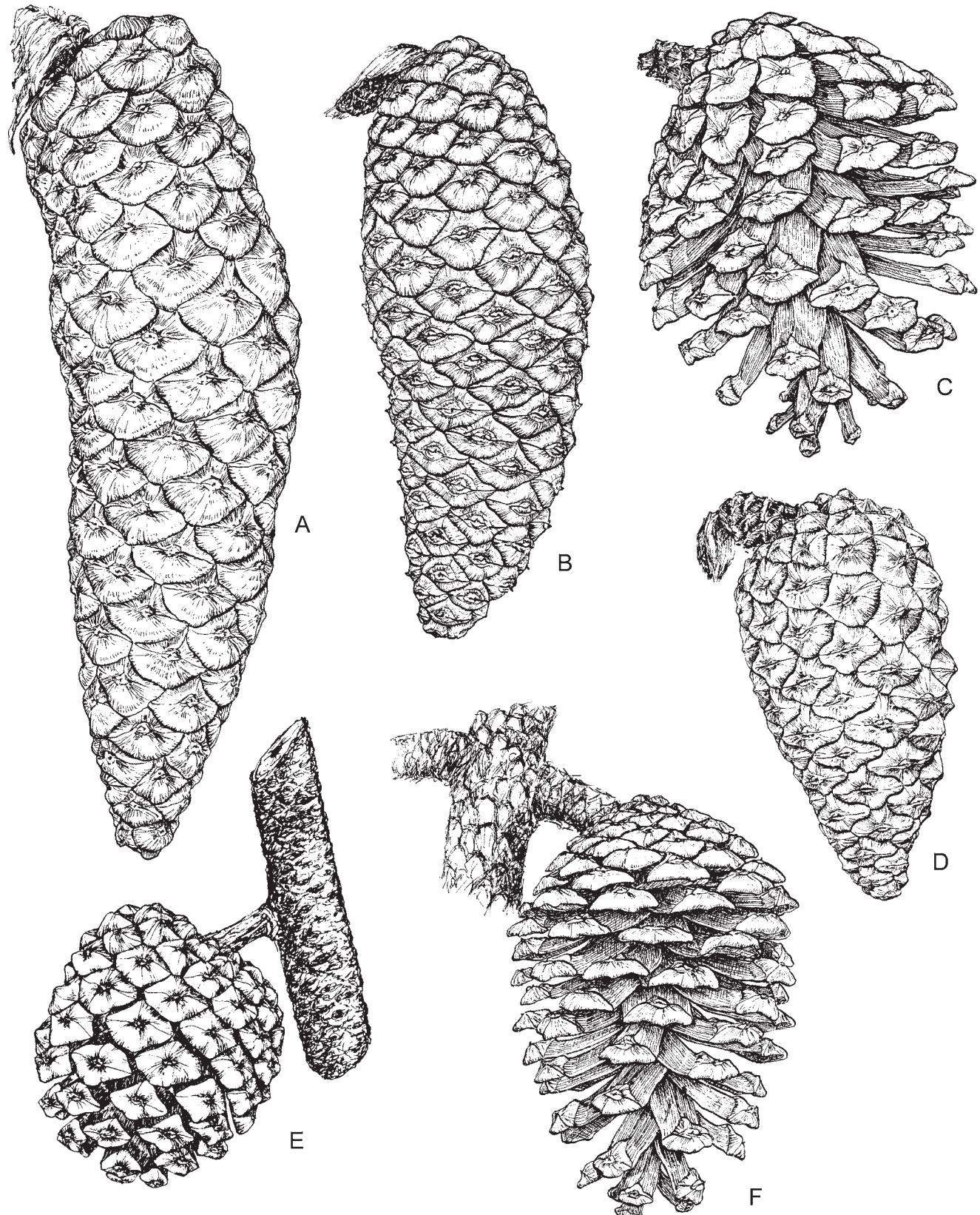


Fig. 55. A: *Pinus greggii* Engelm. ex Parl. var. *australis* Donahue et Lopez – at minor road to Nicolás Flores from road MEX 85, E of Zimapán, Hidalgo, Mexico; alt. 2050 m; R.B., Feb. 2007. B: *P. patula* Schiede ex Schltdl. et Cham. – Parrez, near road from Mexico City to Cuernavaca, Sierra del Ajusco, Distrito Federal, Mexico; c.u., 1982. C, D: *P. pringlei* Shaw – (C) Hilltops near Uruapán, Michoacán, Mexico; alt. ca. 1680 m; coll. C. G. Pringle (No. 10019, type), Oct. 1904; (D) Cerro de la Cruz, Uruapán, Michoacán, Mexico; alt. ca. 1800 m; coll. J. P. Perry, Jr., Feb. 1983. E: *P. luzmariae* Pérez de la Rosa – near San Jerónimo Coatlán, Sierra de Miahuatlán, Oaxaca, Mexico; alt. 1800 m; coll. J. Dobrý, Apr. 1980. F: *P. tecunumanii* Schwerdtfeger ex Egiluz et J. P. Perry – near Teopisca SE of San Cristóbal de las Casas, Chiapas, Mexico; alt. 2270 m; coll. J. P. Perry, Jr., Feb. 1984.

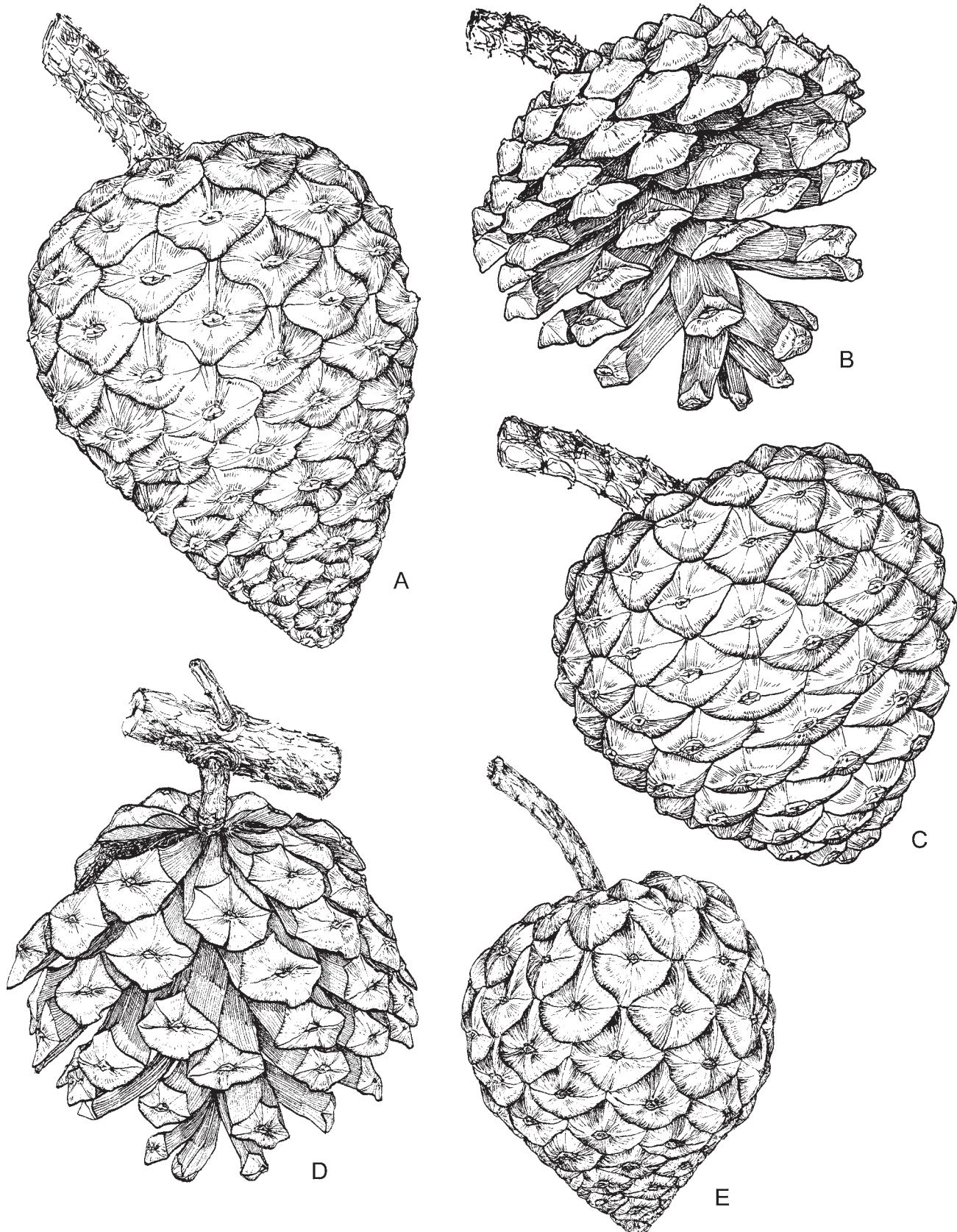


Fig. 56. **A–C:** *Pinus oocarpa* Schiede ex Schltdl. – (A, B) cones from two trees: before Santa Ines at road from Cotija de la Paz to Tocumbo, SW of Zamora, Michoacán, Mexico; alt. 1650 m; R.B., Mar. 1999; (C) ca. 9 km SE of Dos Aguas, Coalcomán de Matamoros, Sierra Madre del Sur, Michoacán; alt. 1850 m; R.B., Mar. 1999. **D, E:** *P. praetermissa* Styles et McVaugh – cones from two trees: near road MEX 15 from Magdalena to Ixtlán del Río around the branch to Hostotipaquillo, Jalisco, Mexico; alt. 1400–1450 m; R.B., Feb./Mar. 1999.

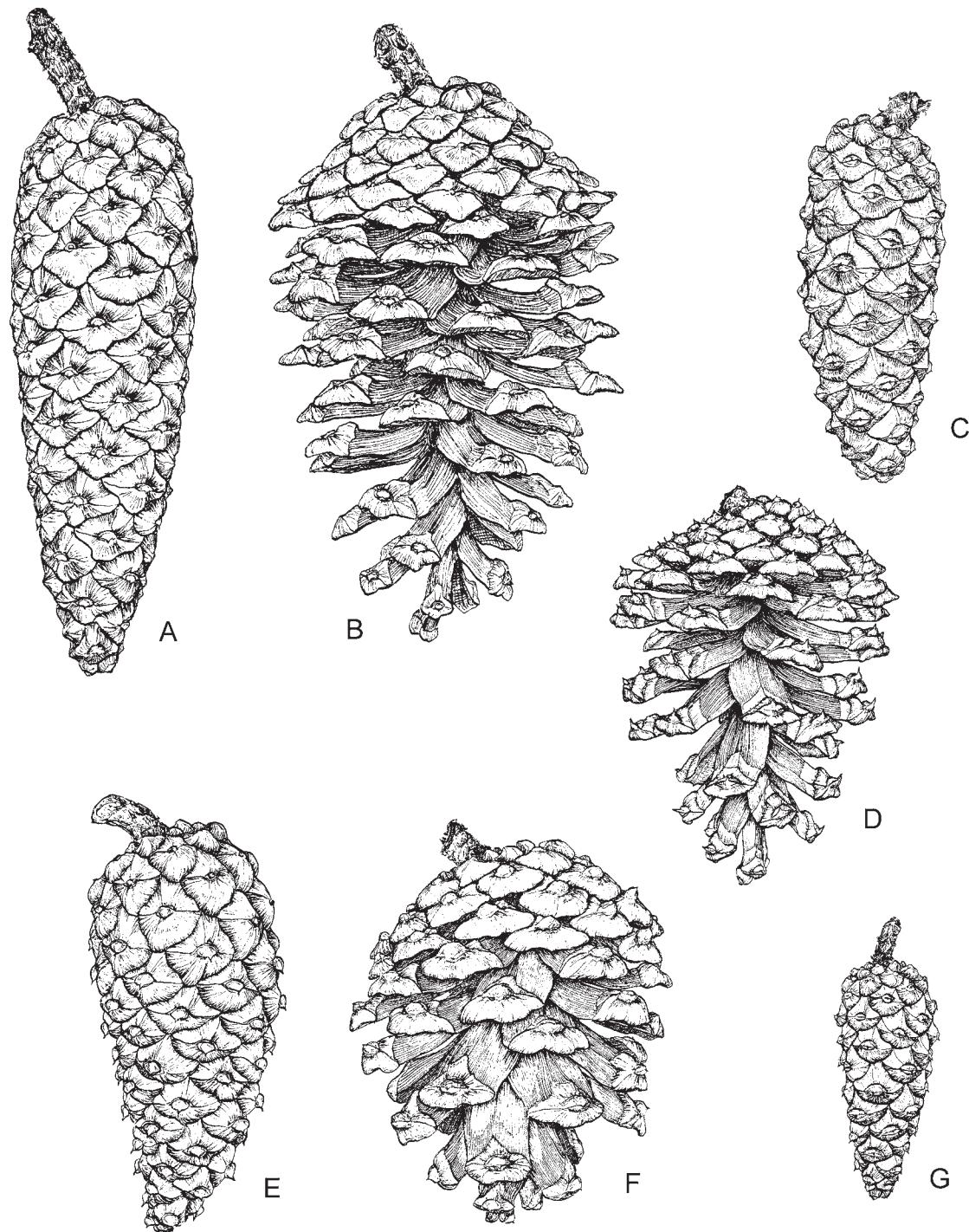


Fig. 57. **A, B:** *Pinus jaliscana* Pérez de la Rosa – cones from one tree from W foothills of Sierra de Cuale NE of El Tuito, S of Puerto Vallarta, Jalisco; alt. 970 m; R.B., Feb. 2007. **C, D:** *P. teocote* Schiede ex Schleidl. et Cham. – (C) near road MEX 40 betw. Navios and El Salto, Durango, Mexico; alt. 2620 m; coll. M. Kučera, Oct. 1994; (D) Zoquiapán Natl. Park, NW side of Volcán Iztaccíhuatl, Estado de México; alt. 2700 m; coll. E. Rincon & J. Dobrý, Apr. 1980. **E, F:** *P. lawsonii* Roezl ex Gordon – (E) hillsides near Uruapán, Michoacán, Mexico; alt. ca. 1500 m; coll. C. G. Pringle (No. 10017, lectotype of *P. altamiranoi* Shaw), Oct. 1904; (F) at highway MEX 190 ca. 30 km NW of Oaxaca, Oaxaca, Mexico; alt. 1800 m; coll. J. P. Perry, Jr., Mar. 1979. **G:** *P. herrerae* Martínez – Dos Aguas, Coalcomán de Matamoros, Michoacán, Mexico; alt. 2200 m; coll. J. P. Perry, Jr., Jan. 1979.

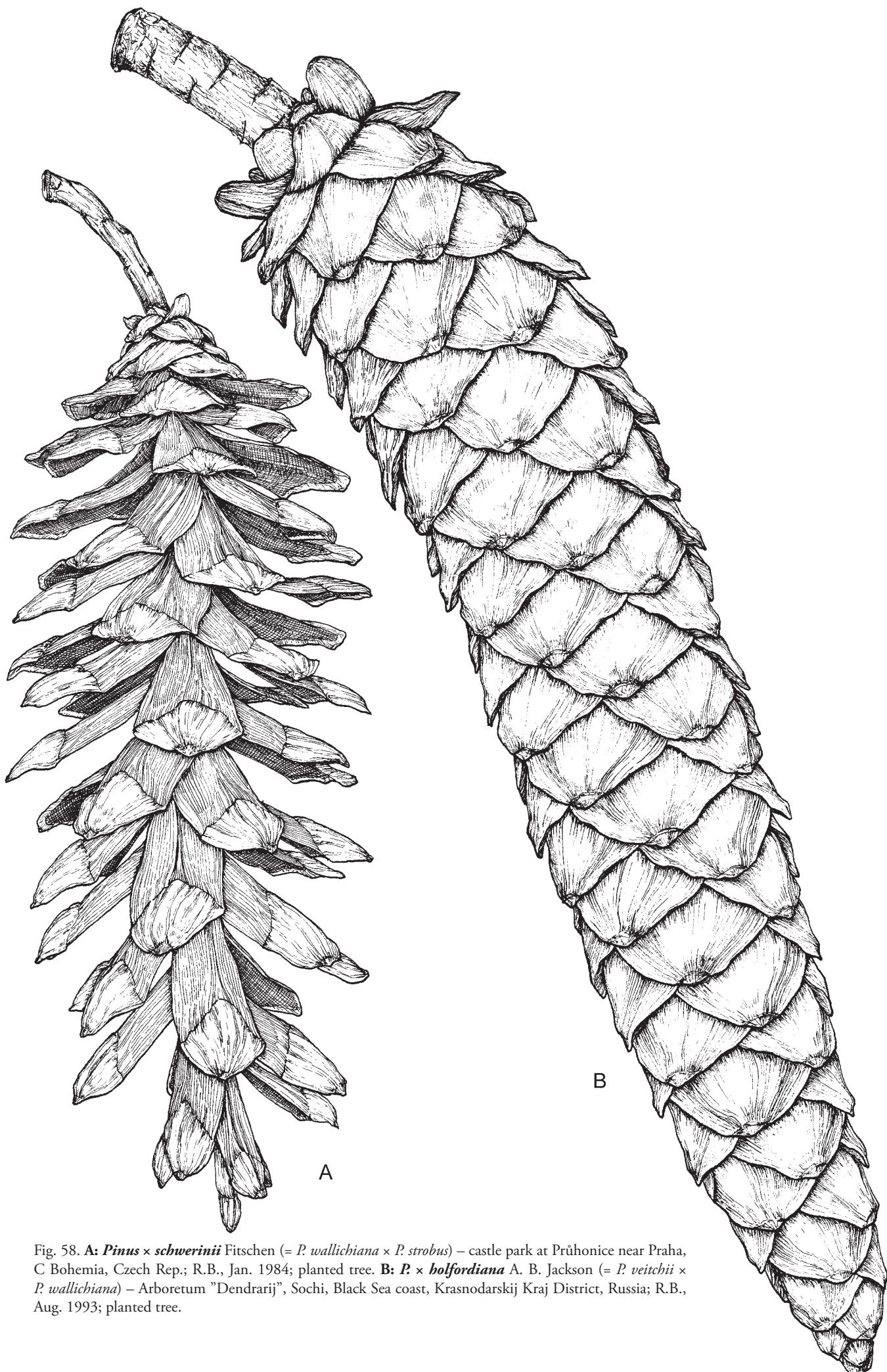


Fig. 58. **A:** *Pinus × schwerinii* Fitschen (= *P. wallichiana* × *P. strobus*) – castle park at Průhonice near Praha, C Bohemia, Czech Rep.; R.B., Jan. 1984; planted tree. **B:** *P. × balfordiana* A. B. Jackson (= *P. veitchii* × *P. wallichiana*) – Arboretum "Dendrarium", Sochi, Black Sea coast, Krasnodarskij Kraj District, Russia; R.B., Aug. 1993; planted tree.

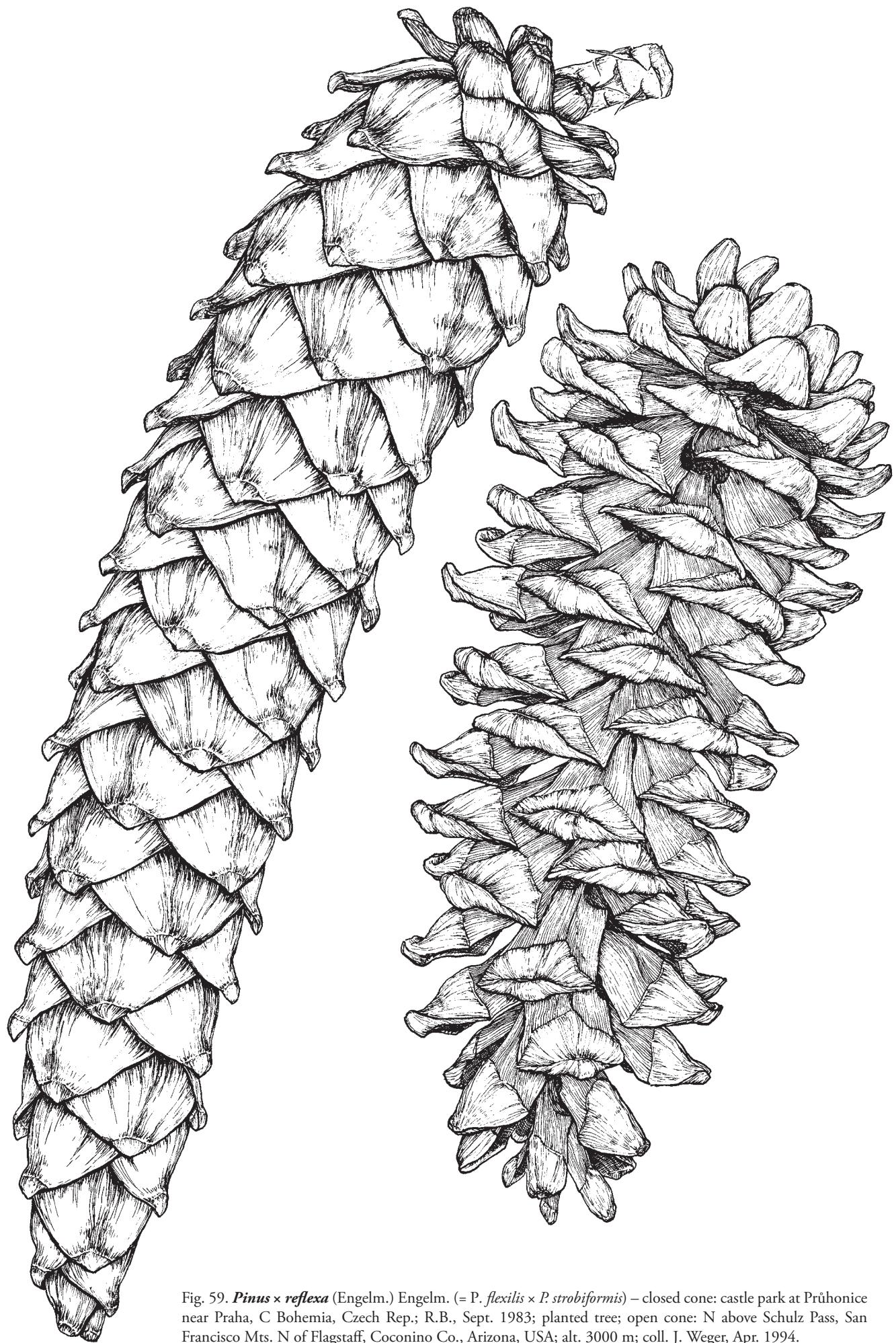


Fig. 59. *Pinus × reflexa* (Engelm.) Engelm. (= *P. flexilis* × *P. strobiiformis*) – closed cone: castle park at Průhonice near Praha, C Bohemia, Czech Rep.; R.B., Sept. 1983; planted tree; open cone: N above Schulz Pass, San Francisco Mts. N of Flagstaff, Coconino Co., Arizona, USA; alt. 3000 m; coll. J. Weger, Apr. 1994.

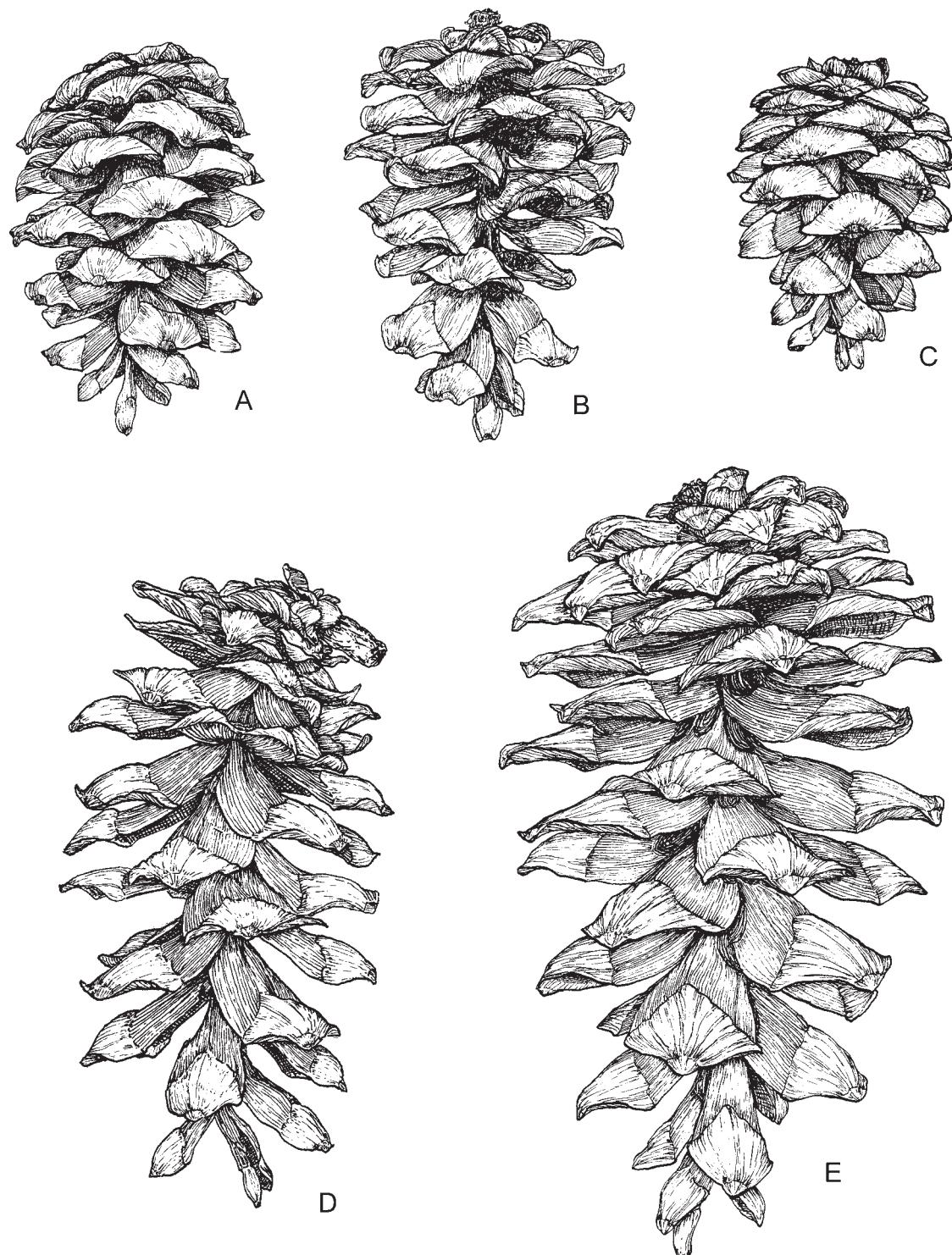


Fig. 60. A–C: *Pinus × hakkodensis* Makino (= *P. parviflora* subsp. *pentaphylla* × *P. pumila*) – cones from three individuals from the Midagahara Plateau, Mt. Tateyama region, Toyama Prefect., Honshu, Japan; alt. 1790–1880 m; R.B., Sept. 1997. D: *P. × hunnewellii* A. G. Johnson (= *P. strobus* × *P. parviflora*) – Rochester, New York, USA; coll. M. Kučera, May 1981; planted tree. E: *P. parviflora* Siebold et Zucc. × *P. flexilis* E. James – Dendrological Garden of the Res. Inst. for Landscape and Ornamental Gardening, Průhonice near Praha, C Bohemia, Czech Rep.; R.B., Sept. 1983; planted tree.



Fig. 61. A–C: *Pinus × bayatana* Businský (= *P. uyematsui* × *P. morrisonicola*) – two cones and seeds from the type specimen tree from the vicinity of Southern Cross-Island Highway in NW corner of Taitung Co., Taiwan; alt. 2060 m; R.B., Dec. 1991. D: *P. × naxiorum* Businský (= *Pinus yunnanensis* × *P. densata* subsp. *densata*) – NW slopes of Yao Shan Mts., Qiaojia Co., NE Yunnan, China; alt. 3050 m; R.B., July 1998. E: *P. patula* Schlehd. et Cham. × *P. taeda* L. – Arboretum "Dendrarij", Sochi, Black Sea coast, Krasnodarskij Kraj District, Russia; R.B., Aug. 1993; planted tree.



Fig. 62.

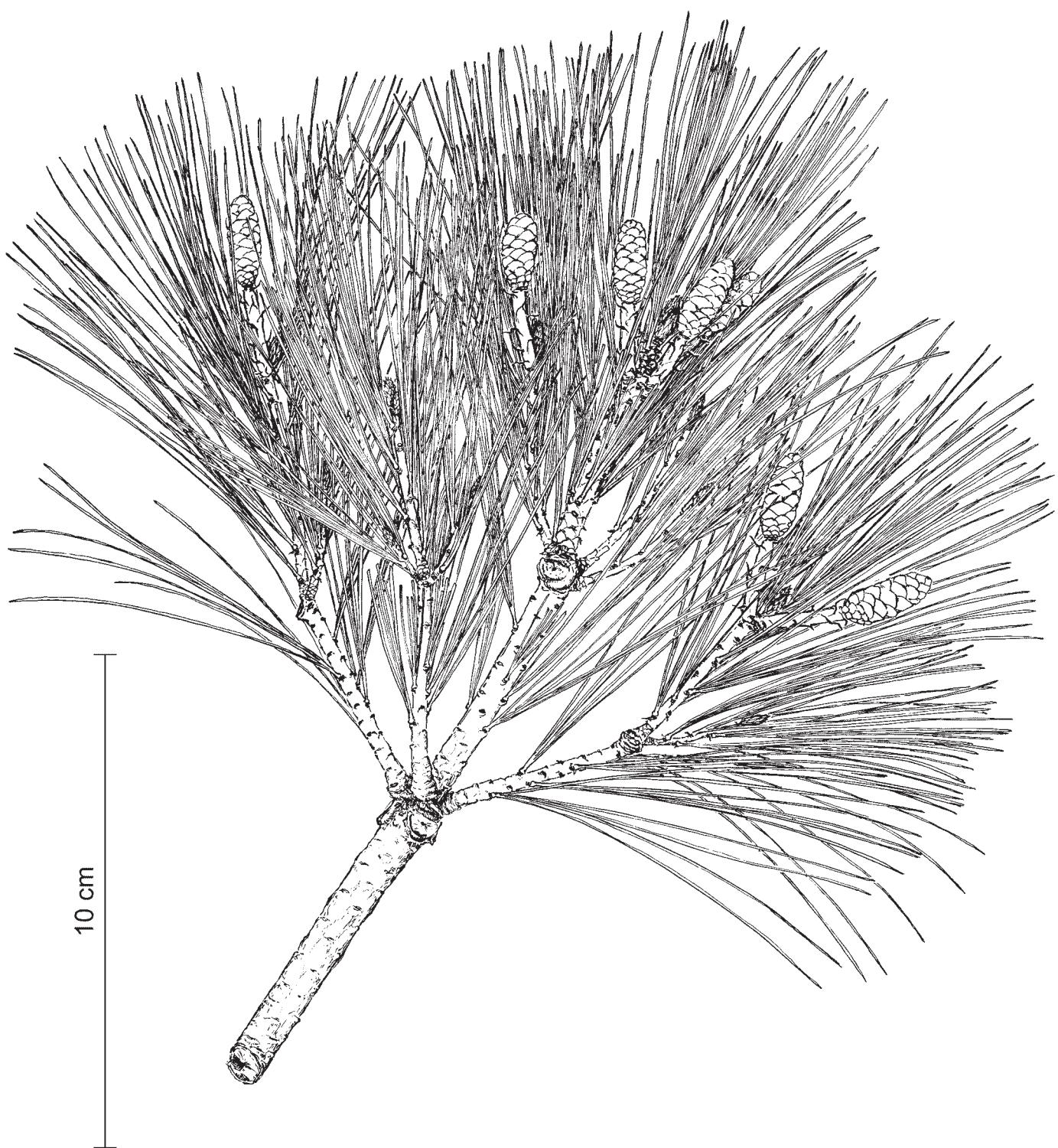


Fig. 63.

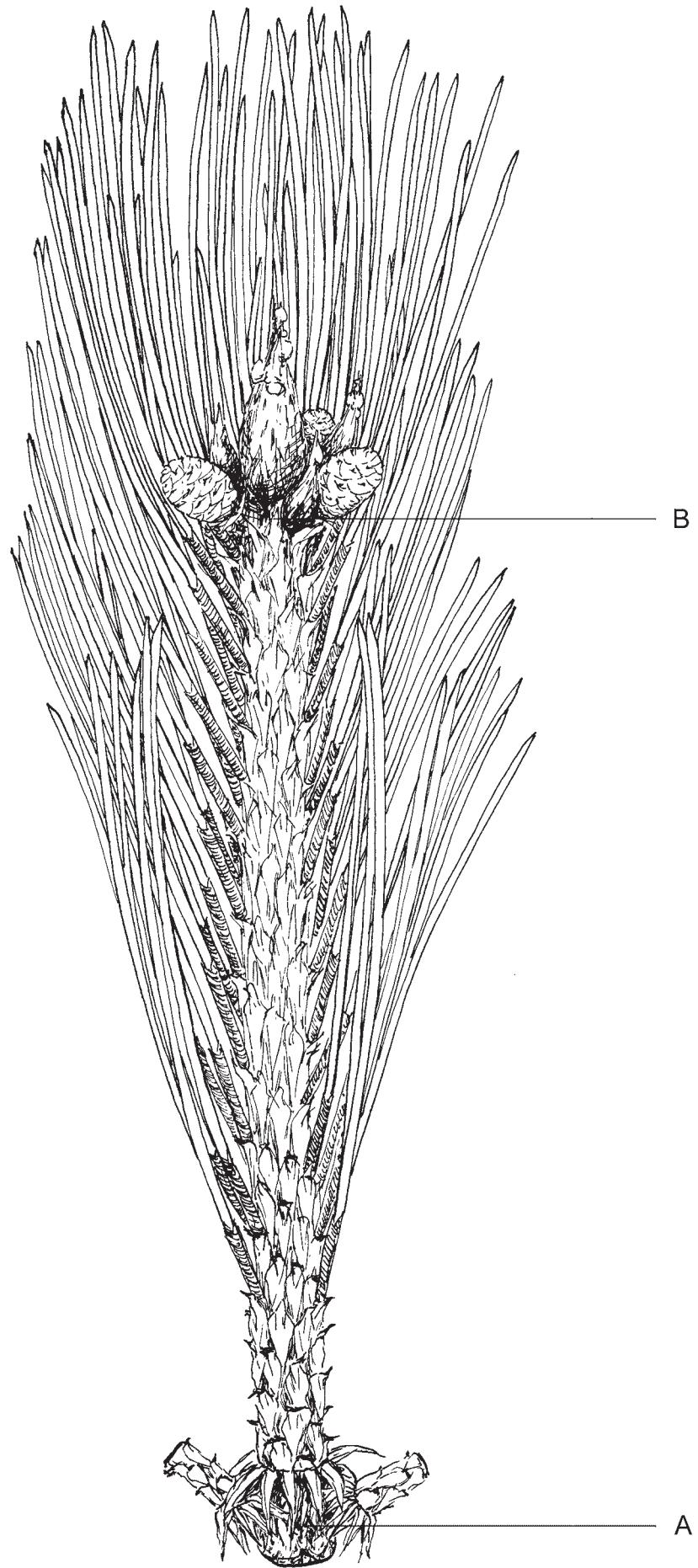


Fig. 64.

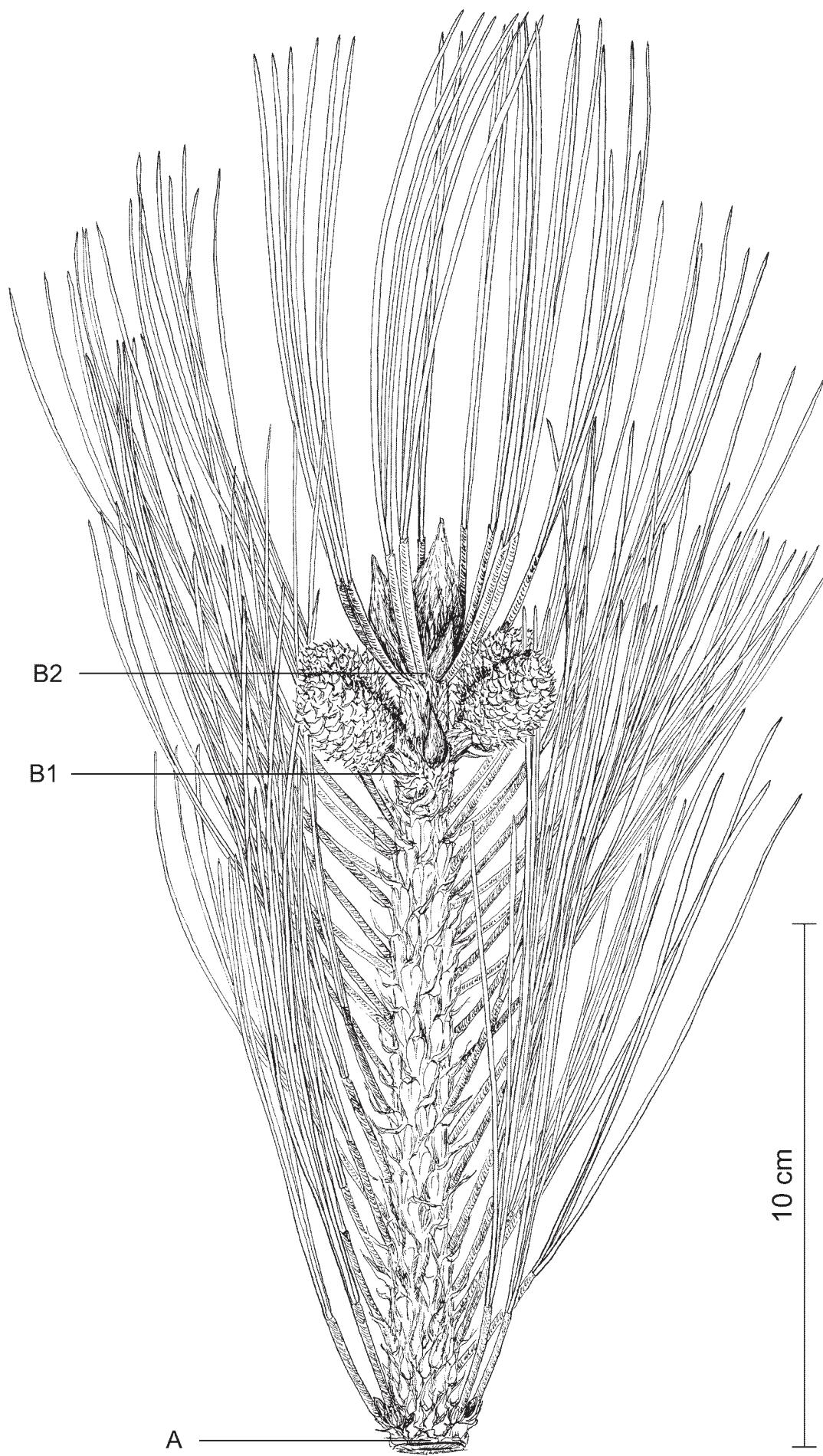


Fig. 65.

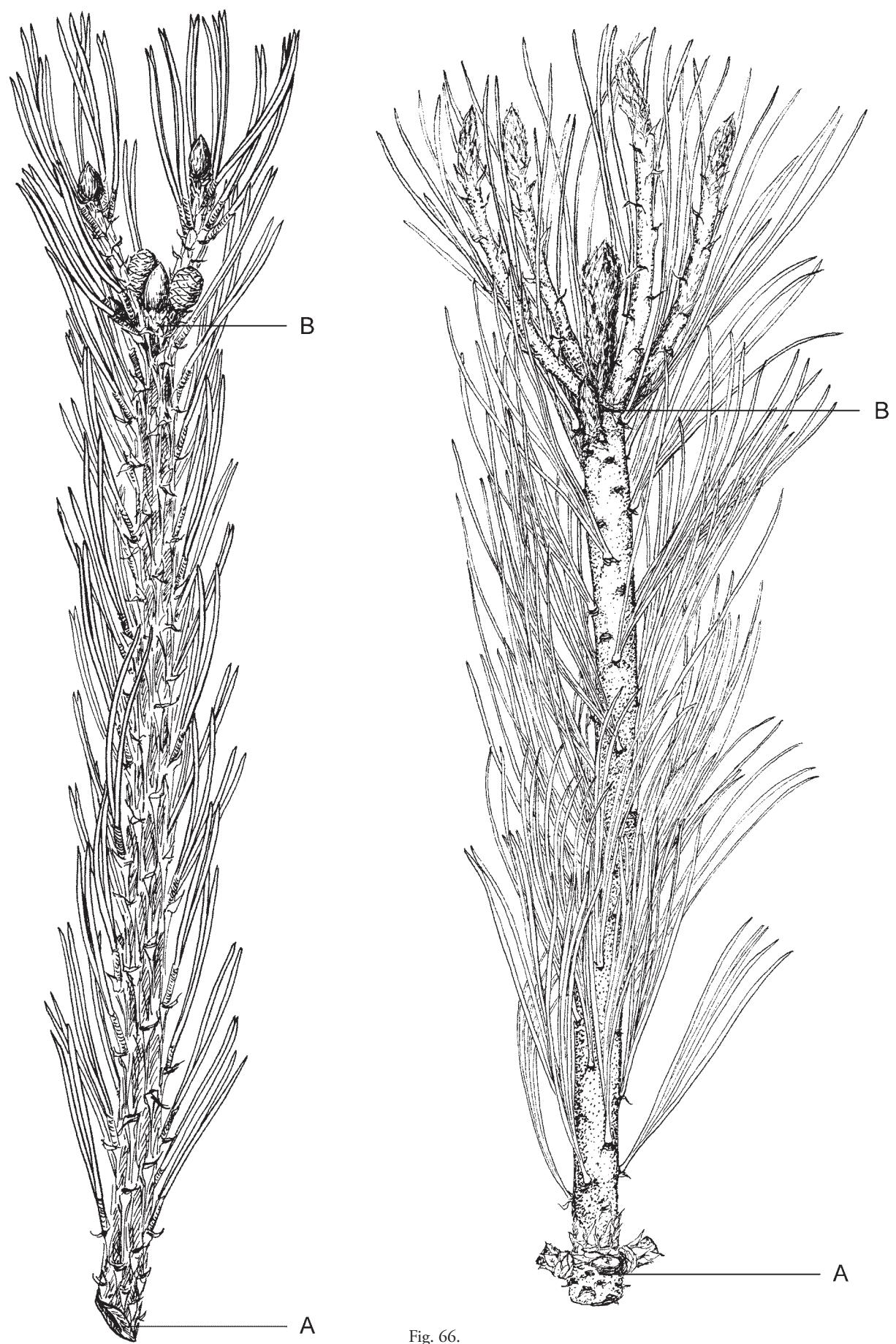


Fig. 66.



Fig. 67.



Fig. 68.

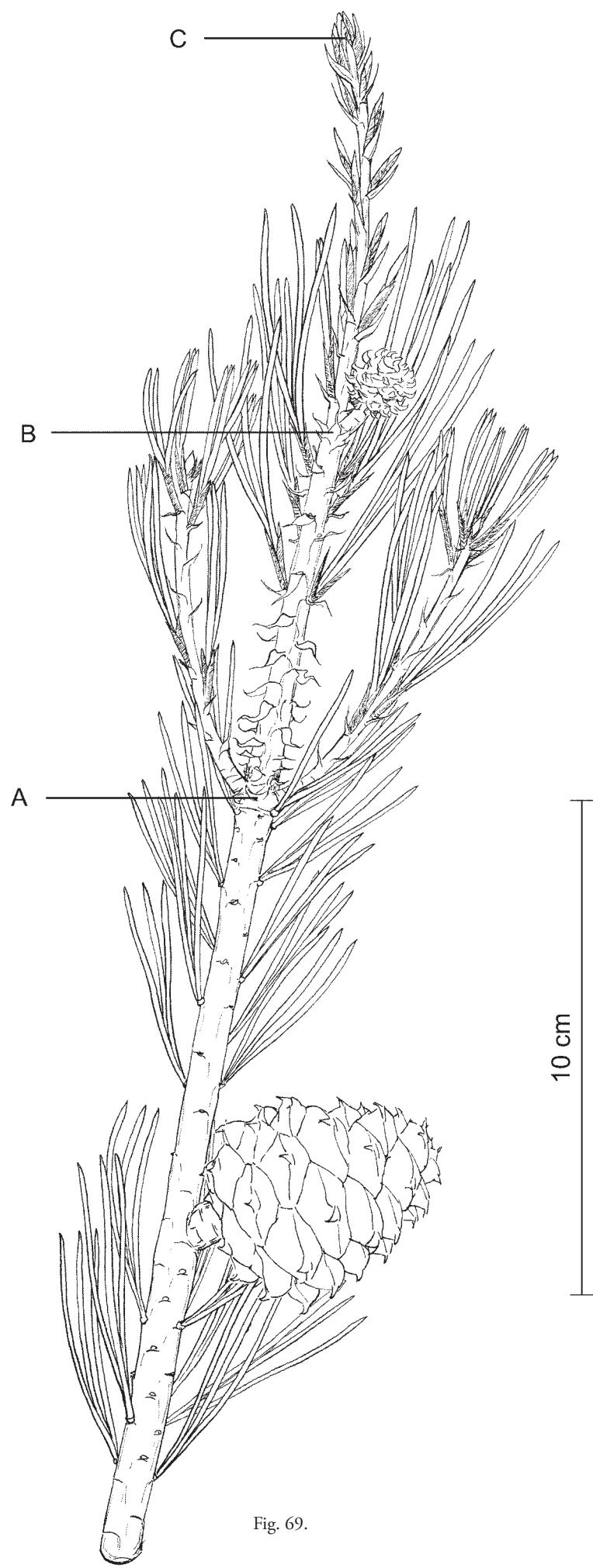


Fig. 69.

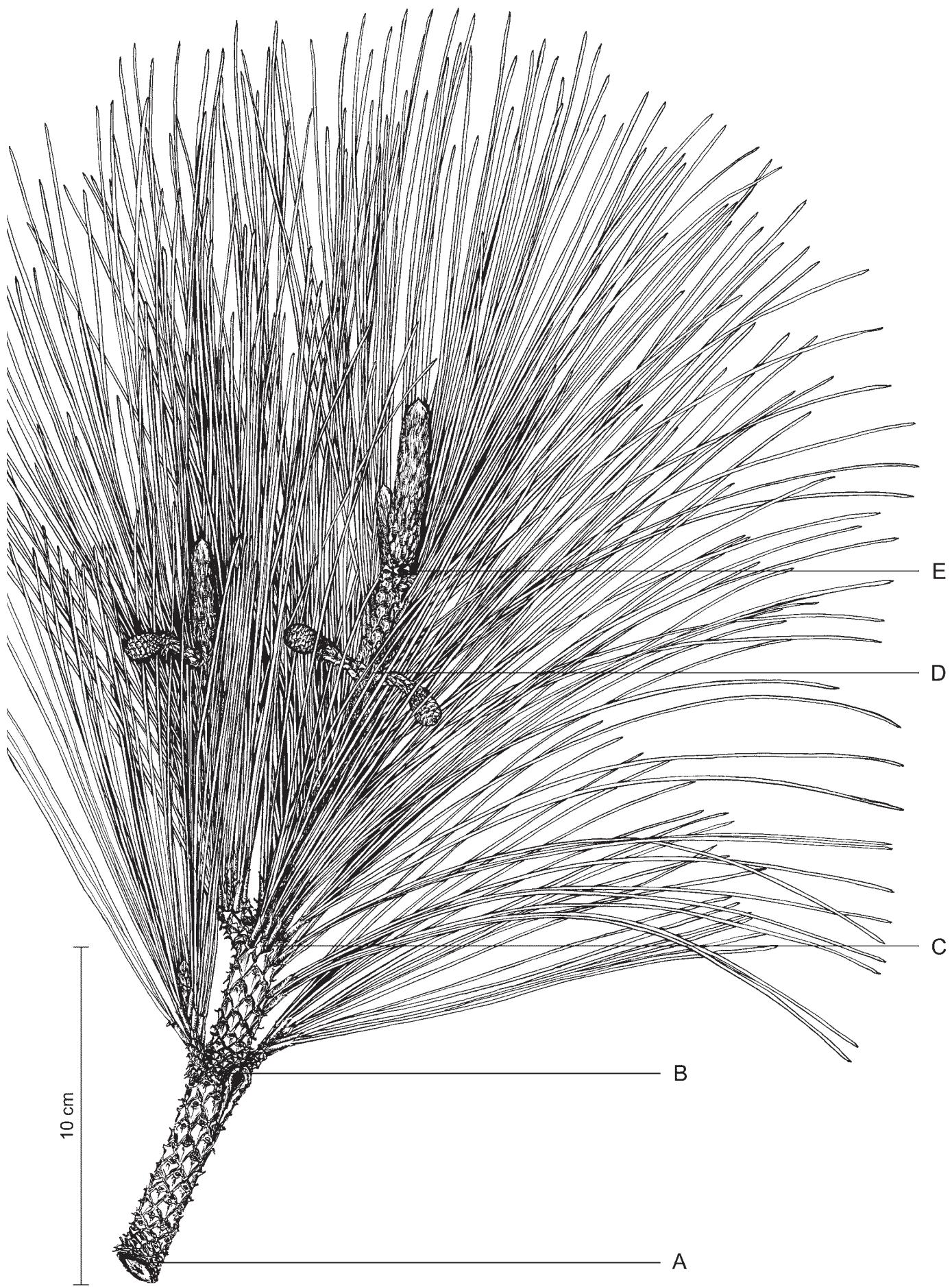


Fig. 70.

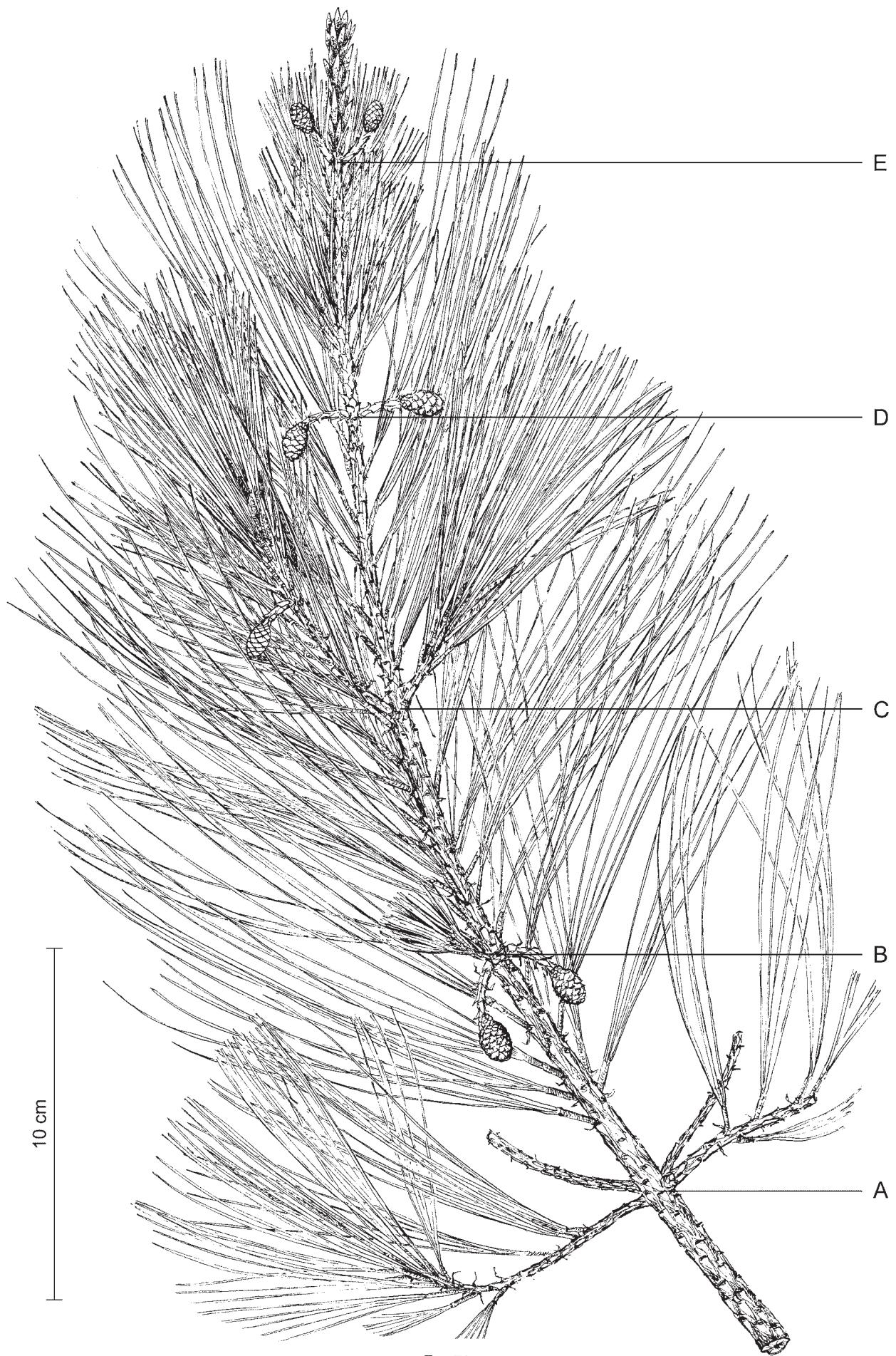


Fig. 71.

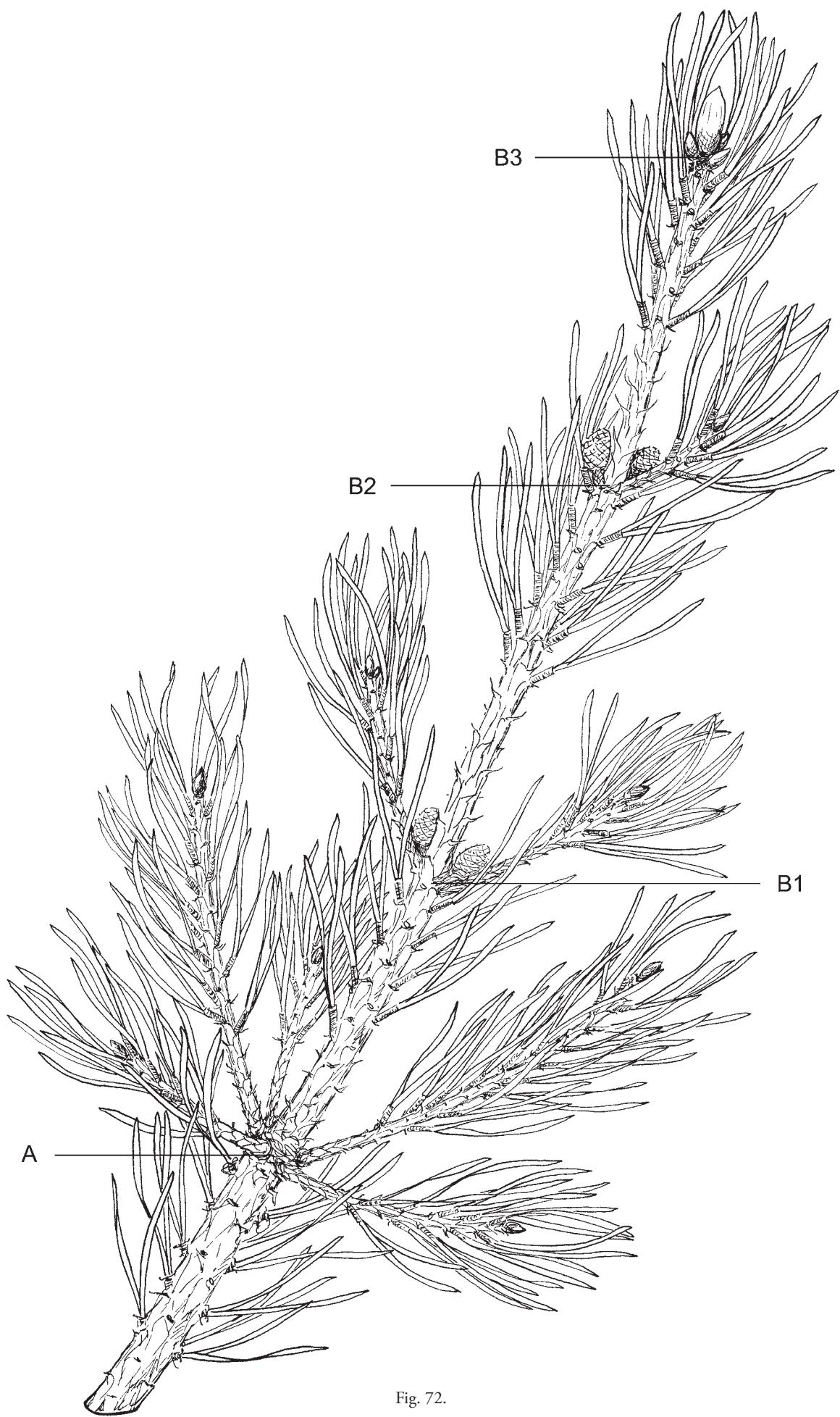


Fig. 72.

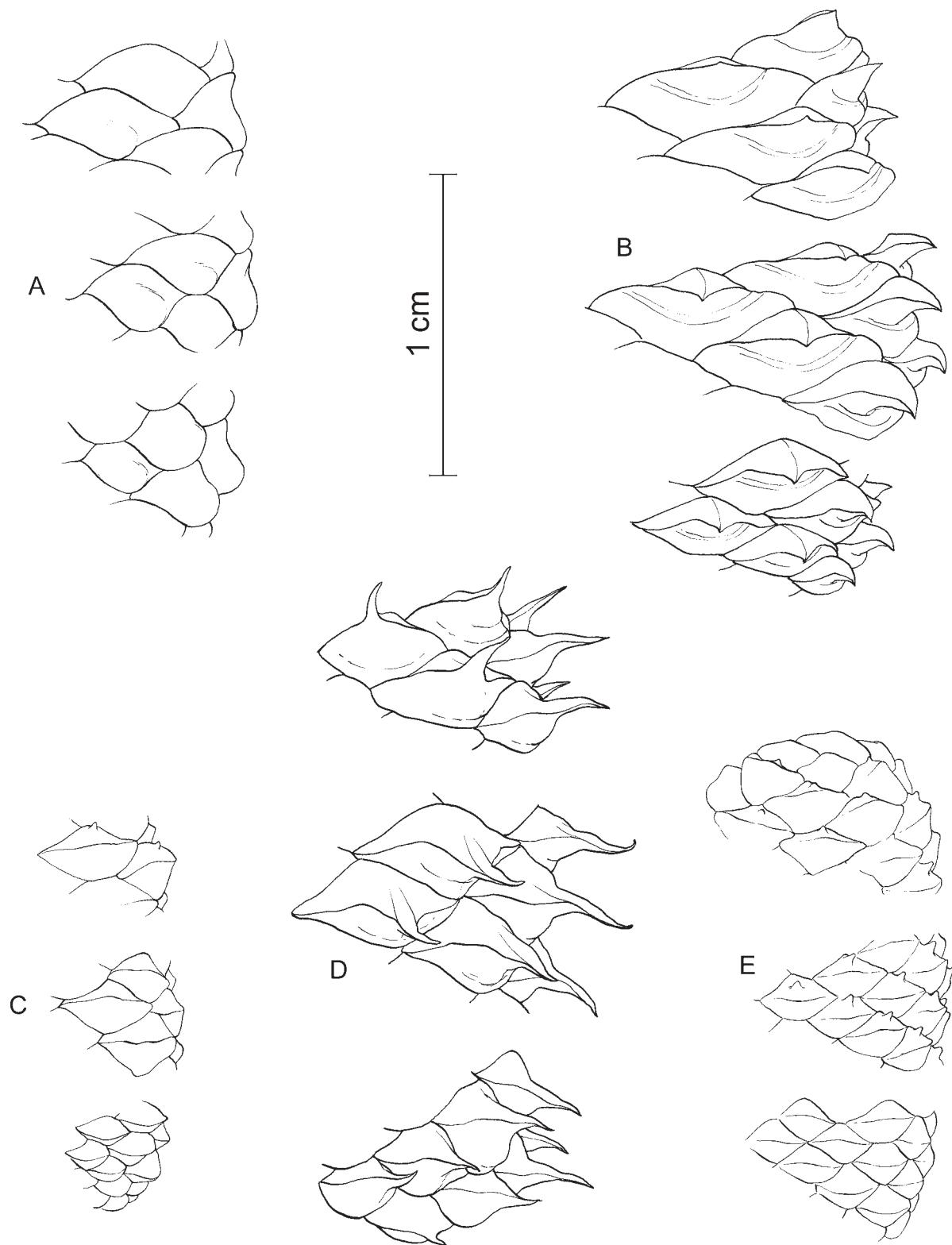


Fig. 73. Examples of microapophysis forms of ovulate strobiles (the apical, central and basal part of the right side of a strobile). A: *Pinus dalatensis* var. *dalatensis* (Trai Mat near Dalat, Lam Dong Prov., Vietnam; alt. 1470 m); B: *P. morrisonicola* (Kukuan env., Taichung Co., Taiwan; alt. 800 m); C: *P. massoniana* (below Tam Dao, Vinh Phu Prov., Vietnam; alt. 600 m); D: *P. ponderosa* var. *scopulorum* (Průhonice near Praha, C Bohemia, Czech Rep.; plantation); E: *Pinus kesiya* (Dalat env., Lam Dong Prov., Vietnam; alt. 1500 m).