



Aspidistra guizhouensis (Asparagaceae), a new species from Guizhou, China

AN-LI LIU¹, WEN-FEN XU² & SHUN-ZHI HE^{2*}

¹Department of Pharmacy, The Second Affiliated hospital of Guiyang College of Traditional Chinese Medicine, Guiyang 550000, People's Republic of China; e-mail: labwck@126.com

²Department of Pharmacy, Guiyang College of Traditional Chinese Medicine, Guiyang 550002, People's Republic of China; E-mail: hesz8899@126.com

*author for correspondence

Abstract

Aspidistra guizhouensis S.Z.He & W.F.Xu, a new species of *Aspidistra* from Guizhou province, China, is described, illustrated and a line drawing of the species is provided. *Aspidistra guizhouensis* is similar to the widespread species *Aspidistra retusa* K.Y.Lang & S.Z.Huang and *Aspidistra sichuanensis* K.Y.Lang & Z.Y.Zhu. The karyotype of this species is analysed.

Key words: China, Guizhou, Asparagaceae, *Aspidistra*, karyotype

Introduction

Aspidistra Ker-Gawler (1822: 628) is a genus of perennial herbs. The genus is distributed in China, India, Japan, Laos, Thailand and Vietnam (Liang 2000). Although new *Aspidistra* species have been discovered frequently, knowledge of the full range of species is thought to be incomplete.

In May 2004, an investigation at the Guizhou province, Guanling County, Huajiang herbal medicine market found around 100 living plants of this particular *Aspidistra* species which were purchased and cultivated in Guiyang. This species bloomed from October to November.

Material and Methods

Aspidistra guizhouensis was identified as a new species after the study of relevant literature (Fang & Yu 2002, He 2002, Li & Tang 2002, Li & Wei 2003, Li 2004, Tillich 2005, 2006, Tillich *et al.* 2007, Tillich & Averyanov 2008, Lin *et al.* 2009, 2011, 2014, Hou *et al.* 2009, Xu *et al.* 2010a, 2010b, He *et al.* 2011a, 2011b, 2013, Gao *et al.* 2011, Hu *et al.* 2014, Meng *et al.* 2014, Vislobokov *et al.* 2014a, 2014b, Sun *et al.* 2014).

Cells of root tips were used for chromosome count and karyotype analysis. Root tips were pretreated in 2 mmol/L 8-hydroxyquinoline at room temperature for 4–5 hours, and then fixed in Carnoy solution (ethanol: acetic acid = 3 : 1) for 24 hours, after maceration in 1N HCl at 60 °C for 10 minutes, material was stained with Carbol Fuchsin and squashed for observation. Five individuals were investigated for each species. Chromosome measurements were obtained from the photographs of the 5 best mitotic metaphase plates. Terminology for position of centromeres on chromosomes follows Levan *et al.* (1964), and general karyotype asymmetry is classified after the semi-quantitative method proposed by Stebbins (1971).

Well developed flower buds (one to three) were collected as samples for each species. Stick dry pollen grains on the copper tape, gold-plated with ion sputtering apparatus (Hitachi E-1010), measured and taken pictures under scanning electronic microscope (Hitachi S-3000). Randomly selected 10 normal pollens for measurement and observation. The description of the pollen mainly based on the standards of Erdtman (1978) and Wang *et al.* (1983).

of *A. retusa* is $2n = 36 = 16m + 6sm + 14st$ (2sat) (Huang 1997), $2n = 36 = 18m + 4sm$ (2sat) + 14st (Wang 1999), the ratio of the longest to the shortest chromosomes is 5.31, 7.19; The karyotype formula of *A. sichuanensis* is $2n = 38 = 22m$ (2sat) + 4sm + 12st (Liu 2012), the ratio of the longest to the shortest chromosomes is 5.77.

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References

- Erdtman, G. (1978) *Handbook of Palynology*. Science press. Beijing, 429 pp.
- Fang, D. & Yu, L.Y. (2002) Three new species of *Aspidistra* Ker-Gawl. (Liliaceae) from Guangxi, China. *Acta Phytotaxonomica Sinica* 40: 159–163.
- Gao, Q. & Liu, Y. (2011) *Aspidistra hezhouensis* (Ruscaceae s.l.) , a new species from Guangxi, China. *Journal of Systematics and Evolution* 49: 506.
http://dx.doi.org/10.1111/j.1759-6831.2011.00159_2.x
- He, S.Z. (2002) A new species of *Aspidistra* Ker-Gawl. (Liliaceae) from Guizhou, China. *Acta Phytotaxonomica Sinica* 40: 377–379.
- He, S.Z., He, K. & Wu, J.Y. (2011a) A new species of *Aspidistra* (Ruscaceae) sp. nov. from Guizhou, China. *Annales Botanici Fennici* 48: 439–442.
- He, S.Z., Liu, A.L. & Xu, W.F. (2013) *Aspidistra australis* (Ruscaceae), a new species from Guizhou China. *Annales Botanici Fennici* 50: 305–308.
<http://dx.doi.org/10.5735/086.050.0502>
- He, S.Z., Xu, W.F., Wang, Y.Y. & Sun, Q.W. (2011b) A new species of *Aspidistra* (Ruscaceae) from Guizhou China. *Novon* 21: 187–189.
- Hou, M.F., Liu, Y., Kono, Y.S.K. & Peng, C.I. (2009) *Aspidistra daxinensis* (Ruscaceae), a new species from limestone areas in Guangxi, China. *Botanical Studies* 50: 371–378.
- Hu, R.C., Shen, X.L., Liu, J. & Lin, C.R. (2014) *Aspidistra stenophylla* (Asparagaceae), a new species from Guangxi, China. *Phytotaxa* 170 (1): 53–56.
<http://dx.doi.org/10.11646/phytotaxa.170.1.8>
- Huang, J.L., Ma, L.M. & Hong, D.Y. (1997) Cytotaxonomic studies on the genus *Aspidistra*. *Acta Phytotaxonomica Sinica* 35: 14–23.
- Ker-Gawler, J. B. (1822) *Aspidistra lurida*. *Botanical Register* 8: 628.
- Levan, A., Fredga, K & Sandberg, A.A. (1964) Nomenclature for centromeric position on chromosomes. *Hereditas* 52: 201–220.
<http://dx.doi.org/10.1111/j.1601-5223.1964.tb01953.x>
- Liang, S.J. & Tamura, M.N. (2000) *Aspidistra* Ker Gawler. In: Wu, Z.Y. & Raven, P.H. (Eds.) *Flora of China* 24. Science Press and Missouri Botanical Garden, Beijing and St. Louis, pp. 240–250.
- Li, G.Z., Lang, K.Y., Wang, R.X. & Wei, Y.G. (2000) On the trends of morphological differentiation and a new system of classification in Chinese *Aspidistra* Ker-Gawl. (Liliaceae). *Guihaia* 20: 201–217.
- Li, G.Z. & Tang, S.C. (2002) New taxa of *Aspidistra* Ker-Gawl. from Guangxi, China. *Guihaia* 22: 289–291.
- Li, G.Z. & Wei, Y.G. (2003) Two new species of the *Aspidistra* Ker-Gawl. (Liliaceae). *Acta Phytotaxonomica Sinica* 41: 381–386.
- Li, G.Z. (Ed.) (2004) The genus *Aspidistra*. Guangxi Science & Technology Publishing House. Nanning, 229 pp.
- Lin, C.R., Guo, L.F. & Bin, Z.F. (2014) *Aspidistra lingyunensis* sp. nov. (Asparagaceae) from limestone areas in Guangxi, China. *Nordic Journal of Botany* 32: 60–63.
<http://dx.doi.org/10.1111/j.1756-1051.2012.01608.x>
- Lin, C.R., Liang, Y.Y & Liu, Y. (2009) *Aspidistra bamaensis* (Ruscaceae), a new species from Guangxi, China. *Annales Botanici Fennici* 46: 416–418.
<http://dx.doi.org/10.5735/085.046.0506>
- Lin, C.R. & Liu, Y. (2011) *Aspidistra punctatoides* sp. nov. (Ruscaceae) from limestone areas in Guangxi, China. *Nordic Journal of Botany* 29: 189–193.

<http://dx.doi.org/10.1111/j.1756-1051.2011.00858.x>

- Liu, A.L., He, S.Z., K.C., Xu, W.F. & Chen, S.L. (2012) Cytotaxonomy of the genus *Aspidistra* from Guizhou. *Plant Science Journal* 30: 1–7.
- Meng, T., Yang, J.C., Tang, W.X., Pan, B. & Lin, C.R. (2014) *Aspidistra tenuifolia* (Asparagaceae), a new species from China. *Phytotaxa* 161: 289–293.
<http://dx.doi.org/10.11646/phytotaxa.161.4.4>
- Peruzzi, L. (2013) “x” is not a bias, but a number with real biological significance. *Plant Biosystems* 147: 1238–1241.
- Stebbins, G.L. (1971) Chromosomal evolution in higher plants. London: Edward Arnold LTD, 216 pp.
- Sun, Q.W., Xu, W.F. & He, S.Z. (2014) A new species of *Aspidistra* (Asparagaceae) from Guizhou, China. *Phytotaxa* 178: 33–37.
<http://dx.doi.org/10.11646/phytotaxa.178.1.3>
- Tillich, H.J. (2005) A key for *Aspidistra* (Ruscaceae), including fifteen new species from Vietnam. *Feddes Repertorium* 116: 313–338.
<http://dx.doi.org/10.1002/fedr.200511076>
- Tillich, H.J. (2006) Four new species in *Aspidistra* Ker-Gawl. (Ruscaceae) from China, Vietnam and Japan. *Feddes Repertorium* 117: 139–145.
<http://dx.doi.org/10.1002/fedr.200511091>
- Tillich, H.J. (2008) An update and improved determination key for *Aspidistra* Ker-Gawl. (Ruscaceae, Monocotyledons). *Feddes Repertorium* 119: 449–462.
<http://dx.doi.org/10.1002/fedr.200811174>
- Tillich, H.J. & Averyanov, L.V. (2008) Two new species and one new subspecies of *Aspidistra* Ker-Gawl. (Ruscaceae) from Vietnam. *Feddes Repertorium* 119: 37–41.
<http://dx.doi.org/10.1002/fedr.200711143>
- Tillich, H.J., Averyanov, L.V. & Dzu, N.V. (2007) Six new species of *Aspidistra* (Ruscaceae) from Northern Vietnam. *Blumea* 52: 335–344.
<http://dx.doi.org/10.3767/000651907X609070>
- Vislobokov, N.A., Sokoloff, D., Degtjareva, G., Valiejo-Roman, C. & Kuznetsov, A. (2014a) *Aspidistra xuansonensis* (Asparagaceae), a new species from northern Vietnam. *Phytotaxa* 173 (3): 226–234.
<http://dx.doi.org/10.11646/phytotaxa.173.3.5>
- Vislobokov, N.A., Sokoloff, D., Degtjareva, G., Valiejo-Roman, C., Kuznetsov, A.S. & Nuraliev, M. (2014b) *Aspidistra paucitepala* (Asparagaceae), a new species with occurrence of the lowest tepal number in flowers of Asparagales. *Phytotaxa* 161 (4): 270–282.
<http://dx.doi.org/10.11646/phytotaxa.161.4.2>
- Wang, K.F. & Wang, X.Z. (1983) Outline of palynology. Peking University press, Beijing, 205 pp.
- Wang, R.X., Li, G.Z. & Lang, K.Y. (2001) Karyotypes of eight species of the genus *Aspidistra* from China. *Acta Phytotaxonomica Sinica* 39: 51–64.
- Wang, R.X., Li, G.Z., Lang, K.Y., Wei, Y.G., Liu Y. & Zhang, X.H. (1999) Cytotaxonomy of the genus *Aspidistra* from China I. Karyotypes of four species endemic to Guangxi. *Guihaia* 19: 229–232.
- Xu, W.B., Huang, Y.S., Ye, X.X. & Liu, Y. (2010a) *Aspidistra connata* H.-J. Tillich, a newly recorded species of *Aspidistra* (Ruscaceae) from China. *Guihaia* 30: 613–615.
- Xu, W.F., He, S.Z. & Yang, L. (2010b) *Aspidistra chishuiensis* (Ruscaceae), a new species from Guizhou, China. *Annales Botanici Fennici* 47: 118–120.