

Species Datasheet

Datasheet No. A-073.002.030
(family.genus.species)

DBT- Network Programme

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1. Taxon:

Species *Allium sativum* L.

Subspecies

Variety

Cultivar

Hybrid

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2. Synonyms: *Allium arenarium* Sadler ex Rchb, *A. controversum* Schrad. ex Willd., *A. longicuspis* Regel, *A. ophioscorodon* Link, *A. pekinense* Prokh., *A. sativum* subsp. *asiae-mediae* Kazakova, *A. sativum* f. *asiae-mediae* Kazakova, *A. sativum* var. *controversum* (Schrad. ex Willd.) Nyman, *A. sativum* subsp. *controversum* (Schrad. ex Willd.) K.Richt., *A. sativum* subsp. *ophioscorodon* (Link) Schubl. & G.Martens, *A. sativum* var. *ophioscorodon* (Link) Doll, *A. sativum* var. *pekinense* (Prokh.) F.Maek., *A. sativum* f. *pekinense* (Prokh.) Makino, *A. sativum* f. *sagittatum* Kazakova, *A. sativum* var. *sativum*, *A. sativum* var. *subrotundum* Gren. & Godr., *A. sativum* subsp. *subrotundum* (Gren. & Godr.) K.Richt., *A. sativum* f. *vulgare* Kazakova, *A. scorodoprasum* var. *viviparum* Regel, *A. scorodoprasum* subsp. *viviparum* (Regel) K.Richt., *Porrum ophioscorodon* (Link) Rchb., *P. sativum* (L.) Rchb.

3. Systematic Position:

APG IV (2016)

- Kingdom: Plantae
- Clade: Angiosperms
- Clade: Monocots
- Order: Asparagales Link
- Family: Amaryllidaceae J. St.-Hil.
- Subfamily: Allioideae Herb.
- Genus: *Allium* L.
- Species: *A. sativum* L.

Bentham and Hooker (1862)

Kingdom: Plantae
Division: Phanerogamia
Class: Monocotyledones
Series: Coronarieae
Ordo: Liliaceae Juss.
Genus: *Allium* L.
Species: *A. sativum* L.

4. Distribution:

Global: Extensively cultivated in India and other countries- Iran, Kazakhstan, Kirgizistan, Tadjikistan, Turkmenistan, Uzbekistan,

India: Extensively cultivated throughout India

5. Indigenous/Exotic/ Endemic; Cultivated/Wild: Extensively cultivated

6. Threat Status:

IUCN: Not been assessed yet

BSI:

7. Habit and Habitat: Herbaceous, height upto 1m; Temperate

8. Life Form: Bulbous geophyte.

9. Economic Importance: Spice and medicine

10. Probable Progenitor of:

11. DNA

C- value

2C (32.45 pg)^{3,4}

4C (64.90±1.17 pg)^{3,4}

4C (65.40 pg)⁷⁹

4C (73.59-91.80 pg)¹

4C (120 pg)⁹³

Methodology

Feulgen Cytophotometry^{1,3,4,93}

12. Basic chromosome number(s): x=8³⁷

13. Zygotic chromosome number(s):

2n=16

1,2,3,4,7,9,13,14,20,23,37,58,59,60,61,62,63,79,93,95,162,168,172,186,201,252,253,254,255,256,257,258,259,260,261,262,263,264

2n=12²⁵⁶

14. Gametic chromosome number(s): n=8^{58,93}

15. Specialized chromosomes (B chromosomes/Sex chromosomes/Polytene chromosomes/Neocentric chromosomes):

Image file

16. Ploidy level: Diploid^{1,3,4,7,20,37, 58,59,60,63,79,93,258}

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17. Agametoploidy

18. Nature of polyploidy (auto, segmental, allo, autoallo):

19. Genomic formula:

20. Aberrant chromosome number(s) (aneuploidy, aneusomy, polysomy):

21. Somatic chromosomes:

Karyotype Majority metacentric chromosomes^{2,20,23,59,60}
Majority submetacentric chromosomes²⁵⁸

Chromosome size Medium²⁰ or large^{23,258}

NOR chromosome(s) 2 NOR^{20,23,58}, 4 NOR^{2,59,60,258}, 6 NOR⁹³

Degree of asymmetry:

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22. Banding pattern(s): Giemsa C-Bands located at secondary constriction region of nucleolar chromosomes³⁰;

Only 4 of the 16 chromosomes showed Giemsa bands in general. On the basis of banding pattern, 3 groups detected- a) Bulbs with chromosomes showing bands only on 1 pair having secondary constrictions, b) Bulbs with chromosomes showing bands on two pairs with secondary constrictions, but heteromorphism in banding pattern was noted in one pair, c) Bulbs with chromosomes showing bands on one pair with secondary constrictions and on two other chromosomes, whose homologues, however, did not reveal bands⁶⁰, Giemsa C banding to the neighbourhood of secondary constrictions and telomeres⁹³, N-banding used to identify bands at 4NORs of chromosomes whereas two of them were darkly stained after silver nitrate staining²⁵⁸

Image file

23. Physical mapping of chromosomes:

In situ hybridization

Image file

Fluorescent in situ hybridization 45S and 5S rDNA localization by fiber FISH⁷⁶

Image file

24. Genomic in situ hybridization:

Image file

25. Linkage map:

Image file

26. Chromosome associations:

Female meiosis

Male meiosis 8 II ⁵⁸, 16 I ³⁷

Image file

27. Chromosome distribution at anaphase I: Normal (8:8) ⁵⁸, Abnormal ³⁷

28. Genetic diversity:

Chromosomal level ⁶⁰

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DNA level ^{64,75,265,266,267,268}

29. Any other information (Apomixis; Inversion; Male sterility; Pollen grain mitosis; Pollen stainability; Translocations etc): Male Sterile ³⁷