A Cytotaxonomtic Comparison of Parsley and Celery

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In 1814, Hoffman established the genus *Petroselinum* based on *Apium Petro-

selinum* L. The principal reason advanced was that in *Apium* the petals are white,

while in *Petroselinum* they are very light green. The writer believes that petal

color is likely to be of very little taxonomic value.

In species of the genus *Apium*, especially *Apium Petroselinum* L., the lateral

branches appear to be the axis, forming a monopodial sympodium, while the true

stem apex produces an inflorescence. In many Umbelliferae, on the other hand,
growth is by quite ordinary monopodial branching. The fruit of the genus *Apium*
is small and ovoid or orbicular. Both *Apium graveolens* (celery) and *A. Petro-
selinum* (parsley) contain the glucoside characteristic of *Apium*.

From a study of *Apium Petroselinum*, Ogawa concluded that the chromosome

number is \( n=11 \). Recently, Wanscher reported *Apium graveolens* to possess the

chromosome number of \( n=11 \), also. In the present cytological observations on the

root-tip cells of *A. Petroselinum* and *A. graveolens* (based upon plants cultivated in

the Botanical Gardens of Kyoto University, Japan), it has been noted that metaphase

plates show \( 2n=22 \) (Figs. I–VI). Karyotype analysis of the two species showed that

metaphase chromosomes comprise two sets of 11 chromosomes (Figs. II, IV–VI).

Through observation of the karyotypes (Figs. II, IV) and idiograms (Figs. V–VI)

indicates that there is a relationship of chromosome morphology between the two

species.

From the fact that *A. Petroselinum* and *A. graveolens* have very similar mor-

phological characters, but are different in the karyotypes, it may be assumed that

they are closely related taxa. I wish, therefore, to express this relationship by placing

them together in the same genus.

Involucel conspicuous; petals light green; node of radical leaf with 11 leaf gaps

.................................................................................... *Apium Petroselinum*

Involucel wanting; petals white; node of radical leaf with 19 leaf gaps ...........

.................................................................................... *Apium graveolens*


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Type locality: "In Sardinia juxta seaturigines."

Distribution: Central and northern Europe; adventive in America and Japan. The plant is cultivated as a vegetable. The karyotype analysis of this species may be depicted as follows:

\[ K(2n) = 22 = 2^A_{SM} + 2^CS_{SM} + 2C_{SM} + 2D_{St} + 10E_{SM} + 4F \]

The lengths of the chromosomes of *A. graveolens* and *A. Petroselinum* are shown below:


Type locality: Europe. This has a wide range in Europe, North Africa, America (adventive), and western Asia to northwestern India, also in Japan; the plant is cultivated for use as a vegetable.

B. Hayata recorded *Apium integrilobum* according to the specimen collected by U. Faurie 122, "in humidis Maruyama, Taipeh, Formosa". The writer, after careful examination of the isotype and many other specimens in the type locality of this plant, concludes that *A. integrilobum* is merely a specimen of *A. graveolens* grown in barren soil. The karyotype analysis of this species may be depicted as follows:

\[ K(2n) = 22 = 2^A_{SM} + 2B_{SM} + 8C_{St} + 8D + 2E \]

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**Literature Cited**

1. Ogawa, Mem. Coll. Sci. Kyoto Univ. 4: Fig. b, 311 (1929) 2. Wanacher, Hereditas 15: Fig. 8, 180 (1931)
Figs. I-VI, Metaphase chromosomes in root-tip cells of *Aptum Petroselinum* L. and *Apium graveolens* L. taken with a imm. obj. (n. A, 1.25) and a periplane oc. of C. Zeiss and magnified by ×2000 (pretreated with 8-Oxyquinoline and stained with Orsein).

Figs. I-II, Somatic chromosomes (2n=22) of *Apium Petroselinum* L. Fig. I, Photomicrograph of metaphase plate. Fig. II, Schematic reproduction of Fig. I.

Figs. III-IV, Somatic chromosomes (2n=22) of *Apium graveolens* L. Fig. III, Photomicrograph of metaphase plate. Fig. IV, Schematic reproduction of Fig. III.

Fig. V, Chromosome idiograms of *A. Petroselinum* L.

Fig. VI, Chromosome idiograms of *A. graveolens* L.

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