sure is adjusted between 1 and 2 psi, and the steam is allowed to flow continuously through the jacket, the chamber, and out the exhaust valve. With this simple operation, the temperature in the chamber can easily be maintained at 100° C.

This device is superior in the following ways:

1. The process of displacing air is simple, quick, and complete.
2. The temperature in both the jacket and the chamber is uniform and the performance perfect.
3. It can also be used for free-flowing steam sterilization.

An Enzyme in Endocrine Tissues which Oxidizes Δ^5-3 Hydroxy Steroids to α,β Unsaturated Ketones[1]

L. T. Samuels, M. L. Helmreich, M. B. Lasater, and H. Reich

Department of Biological Chemistry, College of Medicine, University of Utah, Salt Lake City

All the most active C_{19} and C_{21} steroid hormones contain the Δ^4-3-one structure in ring A. They have been found in the tissues of origin: thus, testosterone has been isolated from testes (*1, 2*), progesterone from corpus luteum (*3, 4*), and cortical steroids from the adrenal cortex (*5, 6*). Cholesterol and Δ^5-3-ol intermediates are presumed to be precursors of the active hormones. Various tissues were investigated for an enzyme that would convert the latter type of structure to the α,β unsaturated ketone. Placental tissue, corpus luteum, interstitial cells of the testis, and the adrenal cortex were found to be very active, but several other tissues examined showed no effect.

The strong absorption band at 238–240 mμ given by the α,β unsaturated ketonic structure was used for routine measurement of its formation. For the incubations, 2 μM of dry steroid were placed in each incubation flask. The steroid was then dissolved in 1 drop of propylene glycol. Weighed portions of the thinly sliced tissues were washed into the flasks with 15 ml of a solution made up of 1 part of homologous serum and 2 parts phosphate buffer, pH 7.4. The flasks were then brought into equilibrium with an atmosphere of 95% oxygen and 5% CO_2, and incubated for 2 hr. A temperature of 37.5° C was used for all tissues except testis; the latter was incubated at 33° C. Δ^5-Pregnene-3β-ol-20-one was incubated with ovarian follicles, corpora lutea, and adrenal cortex of cattle; cryptorchid testes stimulated with chorionic gonadotrophin, placentae, pregnant uterus, and liver of rats; and three types of tumors of mice. Δ^5-Dehydroepiandrosterone was also incubated with the stimulated cryptorchid testes of rats. The results of the incubations are shown in Table 1. It is obvious that only those tissues that normally form hormones with the α,β unsaturated ketonic structure contained the enzymes. Diphosphopyridine nucleotide appears to be an effective hydrogen acceptor in the oxidation.

TABLE 1

FORMATION OF α,β UNSATURATED KETONES BY VARIOUS TISSUES *in Vitro*

Tissue	Steroid	α,β Unsaturated ketone formed (μM/g/hr)	
		Serum	Serum + 6 μM DPN
Cryptorchid testes, rat (2 testes/flask)	Δ^5-Pregnenolone	0.15 (0.10–0.23)	0.33 (0.31–0.34)
Corpus luteum, cow	"	0.29 (0.25–0.36)	1.00 (0.68–1.34)
Ovarian follicle, cow	"	0	0
Adrenal tissue, cow	"	0.23 (0.21–0.25)	0.76 (0.74–0.81)
Leukemia, lymphosarcoma, mammary carcinoma, mouse	"	0	0
Placental tissue, rat	"		0.19 (0.18, 0.20)
Pregnant uterus, rat	"		0
Liver, rat	"	0	0
Cryptorchid testes, rat	Δ^5-Dehydroepiandrosterone	0.11 (0.06–0.14)	0.32

Since other types of conjugated double bond systems give absorption bands in the same region of the ultraviolet spectrum, an isolation was carried out to establish the structure of the compounds formed in the reaction. Material was isolated after Δ^5-pregnene-3β-ol-20-one had been incubated with cryptorchid testes. The infrared spectrum was that of progesterone. The dinitrophenylhydrazone had the same melting point as progesterone bisdinitrophenylhydrazone. It therefore appears that those tissues which form

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hormones containing the α,β unsaturated ketone structure also contain an enzyme that will oxidize the Δ^5-3-ol structure to the conjugated form in the presence of DPN as a hydrogen acceptor. This enzyme would appear fundamental in the biological synthesis of these important hormones.

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Morphology of the Ovary of *Oryza Sativa* Linn. Var. *Plena* ("Double Rice")

R. M. Datta and A. K. Paul[1]

Jute Agricultural Research Institute, Hoogly, West Bengal, India

The ovary of *Oryza sativa* Linn. is superior, one-celled and contains a single ovule. In the variety *Plena* of the same species Prain (*1*) has recorded that there are as many as 7 ovaries in some specimens, the usual number of ovaries found being 2–5. Neither he nor any other worker has mentioned the number of ovules present in each such ovary. S. K. Mukherjee, Curator of the Herbarium, Indian Botanic Gardens, Sibpur, Calcutta, writes from the notes available in the Herbarium thus:

> After the stamens wither, it is most usual to find that only two ovaries continue to develop and then not infrequently one of these fails to grow as fast as the other; but very often both grow equally, and the result is the "Double Rice." In this case the inner faces of both the grains are flat with a whitish vertical central band, and on section, the embryo of each is found at the outer, or glumal, aspect of the base of the grain. In a few cases three grains are developed, and then instead of having flat faces, they meet in the centre at the white line already mentioned, this line being at the apex of an obtuse angle; the embryo is in each case at the outside, as before.

In the course of our study on this variety, we have observed in several cases the presence of 2 ovules in a single ovary, the number of ovaries being the same as mentioned by Prain (*1*). These ovules grow to maturity side by side. They have 2 integuments each. More than one archesporial cell has also been observed (Fig. 1). Morinaga and Fukushima (*2*) found 2 ovules in an ovary of a haploid rice plant (*O. sativa*) and several ovules with 2 embryo-sac mother cells. In *Inapostol,* a Philippine variety of *O. sativa,* Juliano and Aldama (*3*) also recorded a two-celled archesporium in addition to the normal one-celled. They, however, recorded that only one of them becomes functional. Kuwada (*4*) also found a single instance of a two-celled archesporium in a Japanese variety of *O. sativa.*

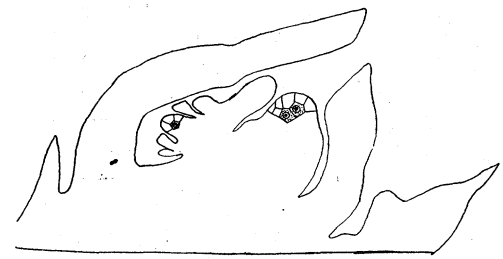

FIG. 1. Section of the ovary of "double rice" showing 2 ovules with two-celled archesporium in one of them. (× 475.)

Hence, "double rice" is not only due to the presence of 2 or more ovaries, each containing a functional ovule, but also due to the presence of more than one ovule, generally 2, in each such ovary—a fact not recorded before. Fuller details will be published later.

[1] We offer our sincere thanks to S. K. Mukherjee for supplying us with the notes at the disposal of the Gardens.

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A Root Disease of Plants Caused by a Nematode of the Genus *Trichodorus*

J. R. Christie and V. G. Perry

Bureau of Plant Industry, Soils and Agricultural Engineering, USDA, and *Florida Agricultural Experiment Station, Sanford*

A root disease of plants that seriously hampers the growing of certain vegetable crops in Florida is caused by a nematode of the genus *Trichodorus* Cobb, 1913. Stubby-root and the stubby-root nematode are suggested as common names for this disease and the causal organism, respectively. Thorne (*1*) places the genus *Trichodorus* in the family Diphtherophoridae of the superfamily Dorylaimoidea. No other member of this superfamily is known to be a serious plant pest, the only ones generally regarded as probably feeding on and injuring the roots of plants being species of *Xiphinema.*

Trichodorus primitivus (deMan 1876) Micoletzky, 1922, was collected first in the Netherlands by deMan, who named and described it (*2*). Subsequently, nematodes that Thorne believed to be the same species were collected by him near Fort Collins, Colo., near San Luis Obispo, Calif., and at various points in Utah, and by Cobb (*3*) near Arlington, Va. The stubby-root nematode is closely related to *T. primitivus,* but because there appears to be doubt in the minds of some taxonomists regarding its specific identity it is herein designated *Trichodorus* sp., pending further study.

Stubby-root has been produced experimentally under conditions sufficiently well controlled to provide