NOTES FROM THE U. S. BUREAU OF CHEMISTRY.*

STUDIES IN MUSTARD SEEDS AND SUBSTITUTES: I. CHINESE COLZA (*BRASSICA CAMPESTRIS CHINOLEIFERA* VIEHOEVER).¹

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[ABSTRACT.]

MATERIAL imported as rape seed and sold as mustard seed was identified as Chinese colza, *Brassica campestris chinoleifera* Viehovever, n. var. The characteristics of the seed have been established, and those which permit the identification and differentiation from true mustard seed have been pointed out. Plants have been grown from the seed, and the characters have been established, especially with reference to their close relationship to the colza group, *Brassica campestris*.

The volatile oil obtained from the material was identified as crotonyl isothiocyanate, which is not a suitable substitute for mustard oil, with respect to condimental, bactericidal, or medicinal value. The fixed oil proved to be of the general composition of the rape oils, and the quantity of the oil present, amounting to more than 40 per cent., characterized the seed as a very valuable oil seed.

On the basis of the general composition of the seed and the character of the volatile oil, it is suggested that the pressed oil cake may well be used as a stock feed.

The leaves are succulent and should be of value as greens.

The plants, which are very vigorous and apparently hardy, seem to offer possibilities as a forage crop. Experiments along this line have been undertaken in coöperation with the Bureau of Plant Industry.

CONDENSED DESCRIPTION OF CHINESE COLZA (*BRASSICA CAMPESTRIS CHINOLEIFERA* VIEHOEVER).

Basal or radical leaves first single, later numerous, arranged in clusters, large glossy green, usually smooth, obovate or round, obovate in general outline, entire or obscurely wavy, variously

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toothed, sometimes crenate, tapering into a distinct thin petiole, which is more or less margined, showing sometimes a few leaf-like lobes.

Leaves of flowering stem more or less glaucous, clasping, obovate, oblong, or somewhat lanciolate acuminate; leaves of secondary stem not always clasping.

Flowers light yellow, of medium size (generally that of mustard flowers), pedicels averaging well over $\frac{1}{2}$ inch.

Pods rather large and long, tapering into conical beak (0.4 to 0.8 inch long); pod and beak together from 2 to 3 inches long; from 8 to 12 seeds in pod.

Seeds yellow and brown, yellow greatly predominating; somewhat compressed, oval, usually distinct ridge on ventral side, usually smooth brown, slightly reticulated, varying in size (from 1.69 to 2.07 mm.), weighing from 1.4 to 6.4 mgm. (1000 seeds weighed 2.865 gm. and 500 cc. weighed 352 gm.).

Seed Coat.—Epidermis about 5 microns thick; when it is moistened shows no swelling, no polarization of light, or cell structure. Parenchyma almost completely compressed. Sclerenchyma (palisade cells), from 15 to 31 microns high and from 8 to 15 wide, strongly thickened at the base and side, without pigment, inner wall smooth. Pigment layer consists of one row of cells containing pigment only in brown seeds. Protein layer is formed usually by one row of large cells (from 15 to 21 microns high and from 15 to 42 microns wide).

Seed.—Composition averages as follows: Over 40 per cent. fatty oil (colza or rape oil type); about 23 per cent. protein ($N = 6.25$); 11.5 per cent. reducing substances; 4 per cent. crude fibre; 0.5 per cent. by hydrolysis of volatile oil consisting of crotonyl isothiocyanate.

THE CARE OF LEATHER.²

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[ABSTRACT.]

DIRECTIONS for the selection of safe, sensible and serviceable boots, shoes, harness, leather belting and other articles, together with detailed advice on the care of leather, are given in Farmers' Bulletin 1183 of the United States Department of Agriculture.

² U. S. Dept. of Agri., *Farmers' Bul.* 1183, issued December, 1920.