

Adsorption by Prepared Calamine.—The same technique described above was used with approximately the same results.

Adsorption by Magnesium Oxide.—The same technique described above was used. It was found that 0.1 Gm. of activated magnesium oxide completely absorbed the ivy phenol whereas 0.5 Gm. each of aluminum oxide or prepared calamine adsorbed little if any ivy phenol from an equal quantity of alcoholic solution. Glycerol up to 6 per cent does not inhibit the adsorption of ivy phenol on magnesium oxide. The magnesium oxide adsorbate of the ivy phenol was held in contact with the skin for twenty-four hours by means of gauze and tape. The results indicated that most if not all of the adsorbed ivy phenol became effective.

Oxidation with Alkaline Peroxide.—A 3 to 5 per cent alcoholic solution of hydrogen peroxide was added to a 70 per cent alcoholic 0.5 per cent sodium hydroxide solution of the ivy phenol. The solution immediately assumed a light pink color. The alkali was neutralized and the resulting mixture gave no color when tested with ferric chloride. The ivy phenol forms a water-soluble green salt with sodium hydroxide. It gradually darkens at the surface and upon exposure to air slowly assumes a pinkish color. Aqueous sodium carbonate does not dissolve the ivy phenol; however, this mixture upon standing assumes a pinkish color.

The author of this paper was the test subject. Alkaline peroxide was used which proved quite effective in the treatment of ivy poisoning. The alkali was sponged over the affected areas followed by the peroxide applied in the same manner. After a few minutes, the alkali was neutralized with a weak solution of acetic acid. Two or three such treatments, once daily, appeared quite sufficient to destroy the ivy phenol that was not too deep seated and prevented it from spreading. Where the lesions were quite deep, the treatment was somewhat painful, but of short duration.

SUMMARY

A preliminary qualitative study has been made upon the effect of some adsorbents, precipitants and oxidants upon the physiologically active phenols found in the milky exudate obtained from *Rhus Toxicodendron*. Calamine and aluminum oxide were found to be extremely poor adsorbents for these phenols. Magnesium oxide was very active as an adsorbent; however, the adsorbate of the ivy phenol when used as such was physiologically very active as a vesicant. Lead acetate and basic lead acetate were the best precipitants found; however, the precipitates were also very active. Oxidants such as ferric chloride and cupric acetate gave precipitates which were also very active. The only suc-

cessful method studied of rendering the active phenols inactive, involved their oxidation with alkaline peroxide.

The Chemistry of Burbot Liver Oil—I*

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The Burbot fish, a fresh water cod, is commonly found in all of our large inland lakes and streams. It is not usually used as food, but has some worth as fertilizer. The average weight of the Burbot is about 5 pounds. The liver is a good deal larger than that of any other fish in the same waters. One such liver used in experimental work weighed 900 Gm. The liver contains from 10% to 56% of oil, the exact amount probably depending somewhat on the age of the fish as well as the water from which it was taken.

Glow and Marlatt (1) have reported the antirachitic potency of Burbot Liver Oil (hereafter abbreviated B. L. O.) as eight times that of cod liver oil, and classed it as an excellent source of vitamin D.

Myers (2) treated fifty infants 1 to 2 months old over a period of 6 to 12 months, and reported the B. L. O. to be a good anti-rachitic agent having a vitamin D potency approximately 8 times that of cod liver oil.

Branion (3) reported that B. L. O. to be a good anti-rachitic agent and that its activity in treating xerophthalmia was greater than that of cod liver oil.

The above is all more or less recent work on B. L. O. vitamin potency; preliminary study on B. L. O. dates back to the work of McCollum and co-workers (4) who found vitamin D in the oil as early as 1922.

The chemistry of this oil, however, has not been given the attention it deserves for the

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scientific literature shows only one recent report on the analysis of the oil, and some work by Lewkowitz in his Volume II, of an oil which he calls "Ling Fish Liver Oil," a type of European Burbot. A recent report by Nelson, Tolle and Jamieson (5) gives a partial analysis of the oil as well as a report of its vitamin activity.

Table I shows our findings on a standard lot of oil blended from several batches. Figures in the table are the average results of many tests. Due consideration was given to the oxidizability of the oil, and a layer of carbon dioxide protected the oil from the air whenever possible.

Table I

Specific gravity, 25° C.	0.9219
Refractive index, 20° C.	1.4776
Optical rotation ^a	-1.3°
Viscosity Saybolt, 27.8° C.	0.376
Viscosity Saybolt, 37.8° C.	0.258
Moisture and volatile matter ^b	0.12
Crismar turbidity	71.56° C.
Acid value	0.25
Saponification value	189
Iodine value (Hanus)	144.1
Unsaponifiable matter, %	1.14

^a In 200-mm. tube, sodium light, 82° F.

^b 3½ hours at 100-105° C. in atmosphere CO₂.

These figures are slightly at variance with those of Nelson, Tolle and Jamieson, and with those found in the New and Non-Official Remedies for B. L. O.

It has been claimed that therapeutic response to B. L. O. is superior to that of C. L. O. Accordingly, we will continue the investigation of the chemistry of B. L. O. in order to determine, if possible, the reason for this superior therapeutic usefulness. Our investigation is to be continued. Later papers will treat of the nature of the fatty acids and esters present in this oil.

SUMMARY

The two points of interest in the report of this investigation are: First, a more complete analysis of the constants of a blend of several batches of burbot liver oil than any that we have seen published heretofore; second, the results of our analysis differ somewhat from those reported by other workers.

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Papain as a Precipitant of Gums*

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In the June 1930 issue of THIS JOURNAL, the writer reported on methylene blue as a precipitant of Irish moss as a contribution to the subject of known means of identifying and differentiating gums. The present note is concerned with the use of papain as a precipitant of gums.

EXPERIMENTAL

Upon attempting to incorporate powdered commercial papain into a fluid preparation containing Irish moss, flocculation of the latter was observed. When papain is added to a Irish moss decoction at room temperature, a ropy, gelatinous, insoluble mass separates out. This action is progressively lessened as the papain solution is progressively more highly alkalinized.

The papain used in these experiments was acid to litmus, methyl red and phenolphthalein, but only slightly so. The papain could be precipitated from aqueous solution by hydrochloric or sulfuric acids whereas the Irish moss decoction could not be precipitated by gross addition of either of these acids. Consequently the flocculating power of the papain does not appear to be a function of its gross acidity.

Flocculation of Irish moss decoction by papain solution is not prevented by adding sodium benzoate, sodium acetate or sodium borate to the papain solution. This is also true of magnesium sulfate, ammonium sulfate, sodium sulfate, sodium succinate, zinc sulfocarbolate and Rochelle salt. Sodium thiosulfate decreased the flocculating action of papain upon Irish moss decoction to some extent. Dibasic sodium phosphate, sodium chloride, potassium chloride, ammonium chloride and sodium glycerophosphate all greatly decrease the flocculating action. Neutral potassium tartrate dissolved in the papain solution reduces the flocculating action of the papain to a much greater extent than any of the above-mentioned substances and

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