

## **Camphorated and Castor Oil Confusion and Its Toxic Results\***

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### INTRODUCTION

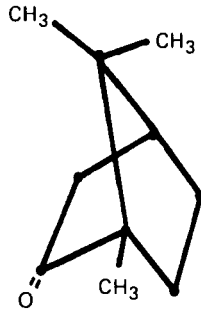
For many years camphorated oil was commonly used externally as a rubefacient, mild analgesic, or employed in liniments as a counterirritant in fibrositis, neuralgia, and similar conditions. It is now falling into disuse, and it is the contention of many authors that because of its toxic nature it should no longer be routinely stocked on the open shelves of stores.

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Camphor itself is a bicyclo-monoterpenoid of the camphene class, having the following structure:



1,7,7-trimethylbicyclo[2.2.1]-2-heptanone  
(camphor)

The two most common forms of camphor products available are:

Camphorated oil (camphor liniment), containing 20% w/w camphor in a suitable oil. Camphorated cottonseed oil (sp. gr. 0.875) would contain 5.25 gm of camphor per 30.0 ml.

Camphor spirit, containing 10% w/v camphor in alcohol (90%). This preparation would contain 3.0 gm of camphor in 30.0 ml.

After oral ingestion, camphor is rapidly absorbed through the mucous membranes and metabolized in the liver to 2-hydroxycamphor and 3-hydroxycamphor, and then it undergoes glucuronic acid conjugation before excretion in the urine.

The symptoms, which usually occur within 30 min, include nausea, a burning feeling in the mouth and throat, vomiting, dizziness, delirium, epileptiform convulsions, dyspnea, and CNS depression. Death usually results from status epilepticus.

Death from respiratory failure is rare, but fatalities have been noted in children with a dose as small as 1 gm. Other persons have survived a dose of 5 gm.

#### Case 1 (B.S.) 8/15/73

A 19-year-old female who mistakenly ingested 2 fl. oz. of camphorated oil when she was instructed to take castor oil prior to an x-ray examination. She arrived at the hospital via ambulance after being

referred from an outlying hospital. Forty-five minutes after she had ingested the camphorated oil she was found unresponsive with her legs and arms stiff, hands stiffly pronated bilaterally, eyes rolled back, and she was salivating. Nurses at the outlying referring hospital described a grand mal type seizure and vomiting.

Upon arrival at the referral hospital the patient was semi-comatose and agitated, and had to be restrained. Blood pressure, pulse, respirations, input, and output were good, and the patient was transferred to the Intensive Care Unit.

The patient responded to conservative therapy without the need of lipid dialysis during the hospitalization. Several liver function tests were recorded as being abnormal which the pathologist read as acute parenchymal liver necrosis, probably due to toxic ingestion of camphorated oil. Kidney function decreased slightly also.

The patient steadily improved clinically, the abnormal liver and kidney function tests returned to within normal limits, and the patient was discharged 13 days after admission.

#### Cause of the Ingestion

The patient purchased what she thought was a bottle of castor oil and this bottle turned out to be camphorated oil (Fig. 1). The patient in this case paid little attention to the label on the bottle and assumed she had taken castor oil.

#### Suggestions to Prevent Future Errors

Bottles of camphorated and castor oil should be physically separated in the store. They are often stocked alphabetically, side by side, on the same shelf (Fig. 2). There is a need for adequate labeling to warn the public against using the product internally, for example, DO NOT DRINK. Castor and camphorated oil made by the same company must be labeled differently by design and/or color to differentiate the two products.

#### Case 2 (M.G.) 2/27/75

A 14-year-old female mistakenly ingested 1-2 fl. oz. of camphorated oil instead of castor oil as a "prep" for a barium enema procedure. The patient soon complained of the taste, and the error was noticed. Upon admission to the emergency room she was given 5 mg of apomorphine. The resulting vomiting produced large amounts of food and oil with a strong smell of camphor. One fluid ounce of magnesium sulfate 50% was administered orally, and an IV was started. The patient was kept in the emergency department's holding room overnight for observation, and released the following morning with no apparent after effects.



FIG. 1. Note similarity in size, shape, and design of the two products. Labels are identical in color format.

### Cause of the Ingestion

The parent purchased the bottle of camphorated oil in a pharmacy, and a clerk wrongly obtained the bottle of camphorated oil instead of castor oil. The parent stated that she had purchased health care items at this establishment for a long period of time and therefore she did not question what was given to her by the clerk.

### Suggestions to Prevent Future Errors

Once again, physical separation of the two oils and an adequate, clearly evident, warning label could have prevented this ingestion.



FIG. 2. Actual store setting with camphorated products on the left of center and castor oils to the right of center.

### Case 3 (R. M.) 4/1/75

At 10:00 P.M. on 4/1/75, a 15-year-old male mistakenly ingested 2 fl. oz. of camphorated oil instead of the prescribed castor oil as a "prep" for a barium enema procedure. Shortly after ingesting the oil, he had a very strong convulsion and then vomited. The mother then brought her son to the emergency room at 11:50 P.M. At first, medical personnel believed the child suffered an epileptic seizure. The causative agent was not discovered until 10 hr later. The mother, upon returning home, re-examined the label of the bottle. She notified the hospital, and at that time, the patient was complaining of blurred vision.

The patient was treated conservatively and observed in the hospital while the camphor was excreted. He was discharged two days after admission without any apparent ill effects.

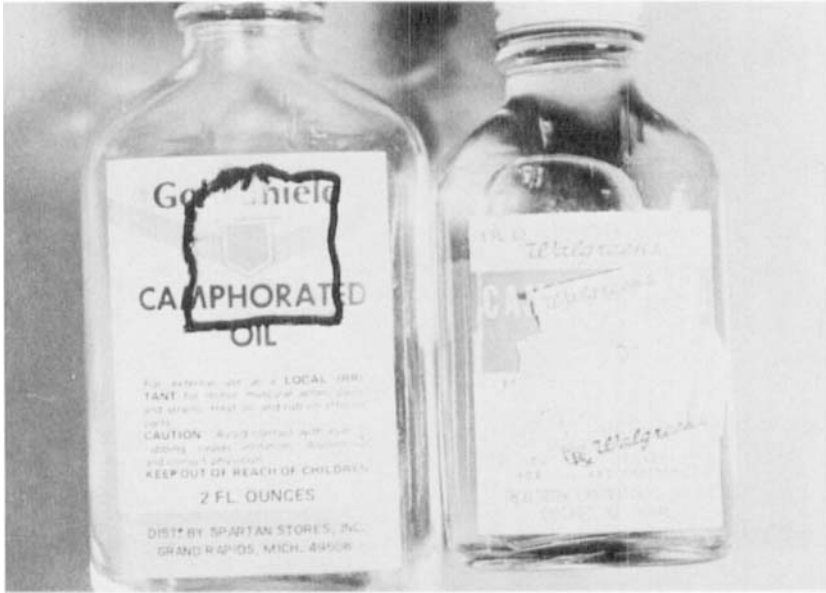


FIG. 3. Note how the original label was obscured by price sticker. Black outline on bottle on left, actually used in Case 3, shows where the price sticker was originally placed.

#### Cause of the Ingestion

The parent purchased the bottle of camphorated oil in a local grocery where store personnel had placed the price sticker over the name of the product. The price sticker obscured the name of the product in such a way that only the letters "CA.....ED OIL" were visible (Fig. 3). The parent, thinking she had a bottle of castor oil, administered the toxic camphorated oil to her son without carefully reading the cautionary label.

#### Suggestions to Prevent Future Errors

The label of the bottle must always be kept unobscured so the product can be clearly identified. According to the F. D. A., obscuring the label is a violation of the laws concerning labeling requirements. Persons working in such a store should place all pricing labeling on the reverse side of the bottle, or other open areas.

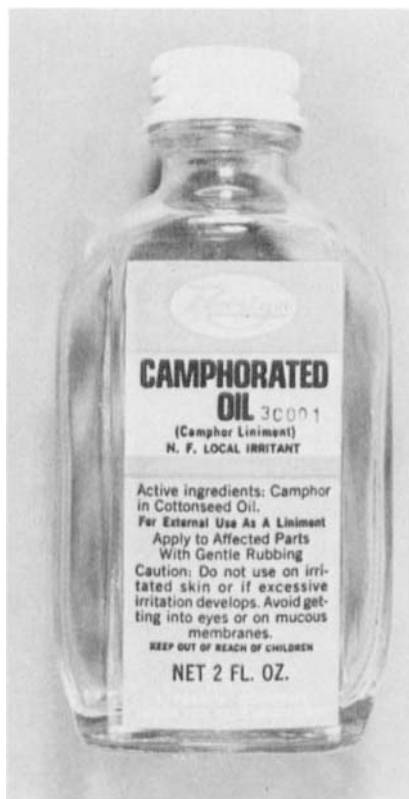


FIG. 4 This photograph shows the need for clear, evident labeling concerning internal use of the product. **DO NOT DRINK** or **DO NOT TAKE INTERNALLY** should appear in addition to a notice indicating the dangers of oral ingestion.

#### ACTIONS TAKEN TO BRING PROBLEM TO THE ATTENTION OF RESPONSIBLE AGENCIES

The Poison Information Center at Bronson Methodist Hospital, which was involved directly or indirectly with all three cases, filed a complaint with the Food and Drug Administration because of in-

sufficient labeling of camphorated oil. A complaint was filed with the Consumer Product Safety Commission because of the lack of safety caps on this potentially lethal household product. Local newspapers and professional literature are calling attention to this potential public hazard.

### DISCUSSION

In summary the three cases discussed in this paper could have been prevented. The following suggestions should be implemented to prevent needless trauma:

1. Stocks of camphorated and castor oils in the store setting should be physically separated rather than sitting side-by-side on the same shelf.
2. Labeling of camphorated oil should be designed to emphasize the danger of using the product internally. Currently many labels merely state "not on mucous membranes" (Fig. 4).
3. Safety caps must be on the product to protect children as well as serving as a reminder to the public to the potential danger of the contents of the bottle.
4. The most severe and probably the most effective measure would be to eliminate the distribution of this product for uncontrolled utilization by the public.

### SUMMARY

Three cases of camphorated oil ingestion occurring over a 20-month period are discussed. Two of the three ingestions resulted in hospitalization, and the clinical course of the ingestions are presented.

Follow-up investigations were performed to determine the causes of the confusion between castor and camphorated oil. Also presented are descriptions of efforts made to improve labeling and packaging of this potentially lethal household product.

Note added in proof:

Since this paper was presented, a fourth case has occurred in the same geographic area. This case was also attributable to the victim's inattention to label details.