Chemical Burn Caused by
*Ranunculus arvensis*

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Abstract: *Ranunculus arvensis* is a wild growing plant, used traditionally for the treatment of various diseases. Very few chemical burn cases resulting from *R arvensis* are reported in the literature. We present a patient who applied the plant *R arvensis* externally to his left leg attempting to alleviate leg pain, and suffered chemical burns as a consequence. Treatment was started with paraffin-impregnated gauze dressings containing chlorhexidine. The patient’s lesions began to recover in 4–5 days, and resolved within 14 days.

*Ranunculus arvensis* L. (family Ranunculaceae) is a wild growing plant used traditionally in China and the Far East for the treatment of rheumatoid arthritis and psoriasis. All parts of this plant are recognized as toxic when fresh.1 Also known as “wedding bloom” in Turkey, *R arvensis* grows wild mainly in the Southeastern Anatolia and Mediterranean regions of the country.2 The adverse effects of Ranunculus family are also related to the amount of time it is in contact with skin and the area of contact. Adverse effects manifest via three main mechanisms: irritant, phototoxic, and hypersensitivity reactions.3–5 Very few chemical burn cases resulting from *R arvensis* are reported in literature. The following report presents a patient who applied *R arvensis* externally to his left leg to alleviate pain and suffered chemical burns as a consequence.

Case Report

A 60-year-old man was admitted to the burn treatment center of the authors’ hospital with a diagnosis of a 20 cm x 10 cm second degree burn on the posterior surface of his left thigh (Figure 1). According to the patient, he had applied a plant, which grows in the region where he lives, to the painful area and then wrapped the area in cloth. He had left this in place for 5 hours, and upon unwrapping his leg, had observed fluid filled sacs in the area where the plant had been applied. He had gone to the hospital for treatment, and although the lesion was treated for 14 days, there had been little improvement. Upon physical examination of the patient, we established a 20 cm x 10 cm second degree burn injury on the posterior surface of the left thigh. The patient was evaluated by the dermatological clinic, and they also
confirmed that the lesion was a burn injury. The hemogram and biochemical values of the patient were normal. *Pseudomonas aeruginosa* proliferated in the culture taken from the lesion. This proliferation was assessed by the Infectious Diseases clinic, and was evaluated as colonization as the lesion was clean and the laboratory values were normal. No antibiotics were started. During the time of his hospital stay, the patient’s injury was covered with paraffin-impregnated gauze dressings containing chlorhexidine in order to protect the wound from infection. Our hospital determined from samples that the plant that had caused the injury was *R. arvensis* (Figure 2). The patient’s injury became 90% epithelized (Figure 3) after 11 days in the hospital and he was discharged.

**Discussion**

*Ranunculus arvensis* L., a member of Ranunculaceae family, grows as a wild plant in productive agriculture lands, primarily in the Mediterranean region and Iran-Uran vegetation areas in Turkey.²⁶ Members of the Ranunculaceae family are used in the traditional treatment of hemorrhoids, burns, the draining of abscesses, bullous lesions, lacerations, and abrasions.¹⁷ Although a study on the organic content of *R. arvensis* has not yet been performed, a number of studies on other species of the Ranunculaceae have established that they contain protoanemonin, as well as hederagenin saponins and oleanolic acid glycosides, which inflame the skin and damage the mucosal membranes subcutis. These substances are used for the treatment of hemorrhoidal symp-
toms. The destructive effect of protoanemonin is much more pronounced when the plant is fresh; however, this effect decreases when the plant is wilted. The in-vitro effect of *R. arvensis* may be due to inhibition of DNA polymerase and an increase in oxygen free radicals. The adverse effects of plants on skin typically manifest via three main mechanisms: irritant, phototoxic, and hypersensitivity reactions. Protoanemonin is a volatile and highly irritant oil, which inhibits mitosis in plants. When in contact with the skin, it produces subepidermal disjunction and bulla formation by disrupting sulphate bridges. Protoanemonin polymerizes rapidly to anemonin, its harmless crystal form. Dried and boiled plants contain no protoanemonin.

We believe that the second-degree burn of our patient was the result of the irritant effect of protoanemonin. Very few chemical burn cases resulting from *R. arvensis* have appeared in the literature. Yenidunya et al. reported a burn case with symptoms similar to those of our patient that developed in connection with *Ceratocephalus falcatus*, another member of the Ranunculaceae. Eskitascioglu et al. also documented a series of five burn cases resulting from Ranunculaceae (*C. falcatus* and *C. testiculatus*). Metin et al. have reported a chemical burn case developed in connection with *R. damascenus*. In the Turkish and English literature, two chemical burn cases have been reported to have developed in connection with *R. arvensis*. In both cases, similar to the case we present in this paper, second degree chemical burns were caused but were completely recovered with treatment. Our case is the third such case in the literature.

**Conclusion**

People need to be made aware that these types of plants, although used throughout history and currently in Turkey and other regions of the world for the traditional treatment of some diseases, can have undesirable effects such as was seen in our case, and that use of modern medical methods should be encouraged for the treatment of illnesses.

**References**