

Bullous dermatitis caused by common juniper

Antonella Tammaro¹  | Ganiyat A. R. Adebajo¹ | Camilla Chello¹ |
Francesca Magri¹ | Alvis Sernicola¹ | Nazareno Gagliostro¹ |
Francesca R. Parisella² | Flavio Tarquini³ | Giulia Wappner⁴

¹NESMOS Department, Dermatology Unit, Sant'Andrea Hospital, Sapienza University of Rome, Rome, Italy

²Department of Medicine, Faculty of Medicine, Queensland University, Brisbane, Australia

³Environmental Biology and Botany Department, Sapienza University of Rome, Rome, Italy

⁴Emergency Department, Sant'Andrea Hospital, Rome, Italy

Correspondence

Professor Antonella Tammaro, NESMOS Department, Dermatology Unit, Sant'Andrea Hospital, Sapienza University of Rome, Via di Grottarossa 1035/1039, 00189 Rome, Italy.

Email: tammaroantonella@gmail.com

KEYWORDS: blisters, case report, contact dermatitis, *Juniperus communis*, occupational, phytodermatitis

The volatile oil, the leaves, and the wood of various juniper species all have the potential to cause an adverse skin reactions following contact. However, the few reports that can be found in the literature are mainly occupational and would suggest that junipers are else not particularly dermatologically hazardous. Here, we report a case attributable to the common juniper (*Juniperus communis* L.) in which the patient presented with burn-like blistering lesions.

CASE REPORT

A 62-year-old woman presented to the emergency room with painful lesions resembling burns. She was employed as a housekeeper but also undertook gardening tasks. She reported that 3 days earlier, she had been walking under the sun carrying a pot with a juniper in close contact with her skin. Painful pruritic lesions developed on that area and worsened dramatically the day after. Dermatological examination revealed well-defined haemorrhagic lesions with blisters (Figure 1A) which had a linear conformation on the left arm (Figure 1B). The juniper was formally identified by a botanist as *J communis* L. (Family: Cupressaceae; Figure 2).

A bullous pathology was ruled out because (a) the direct immunofluorescence assay that we performed on biopsy specimens of uninvolved perilesional skin and nonbullous lesional skin showed negative results, and (b) the complete blood count was normal and anti-80-kDa and anti-230-kDa antibodies were absent.¹ Given the clinical presentation and history of the patient, a diagnosis of a phytodermatitis caused by *J communis* was made. Oral methylprednisolone (40 mg two times/d) was initiated and slowly tapered. The

lesions were irrigated with physiological saline and a paraffin gauze dressing was applied to prevent bacterial superinfection. The patient experienced complete recovery after 10 days of treatment. Residual hyperpigmentation of the affected area was observed.

DISCUSSION

J. communis is a dioecious shrub or small tree that is multistemmed, with branches either spreading or ascending, and with needle-like leaves. This species is the most widespread juniper species, and many subspecies and varieties have been described. In Italy it occurs in the wild from sea level to the alpine horizon and it is also cultivated.²

Several cases have been reported in the literature in which concomitant (delayed) contact sensitivity is observed to colophonium and to a *Juniperus* species/cultivar or another member of the Cupressaceae family (eg, × *Cupressocyparis leylandii*).^{3–6} However, the reaction described here had the characteristics of an irritant rather than an allergic aetiology. The patient was not willing to attend for further investigation to explore this possibility.

Previous reports of skin reactions to juniper species refer to contact with the volatile oil or the wood. An early unsubstantiated report by Nothnagel⁷ noted that *J. communis* volatile oil rubbed onto the skin produces a burning sensation with slight reddening, and may cause blistering if occluded. However, Johnson⁸ concluded in a safety assessment of several juniper-derived extracts that *J. communis* essential oil was neither a skin irritant nor a sensitizer nor phototoxic in animal tests. Therefore, it seems unlikely that our

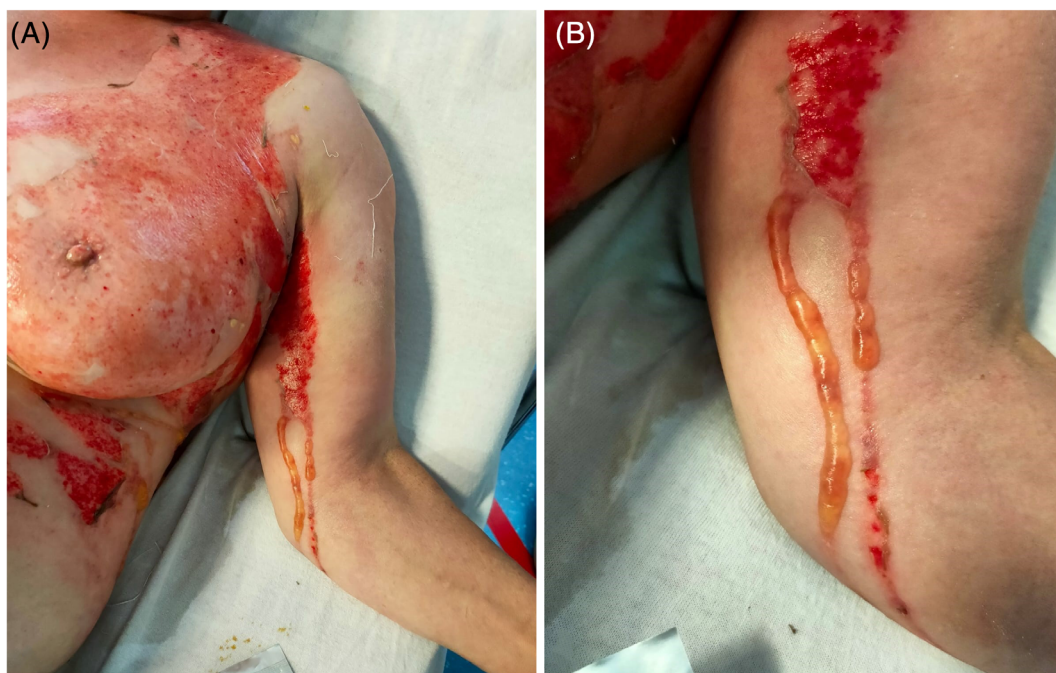


FIGURE 1 (A) Phytocontact dermatitis on the chest and arm of a 62-year-old patient. The lesions are located on the areas that were in close contact with juniper leaves. The lesions are bleeding and eroded. Yellow-/tan-coloured blisters are present. The skin of the breast is affected as well because the patient was wearing a very light top due to the extremely hot and sunny weather of Rome in the summer. (B) Eroded, well-defined bleeding lesions with a linear conformation on the left arm of the patient

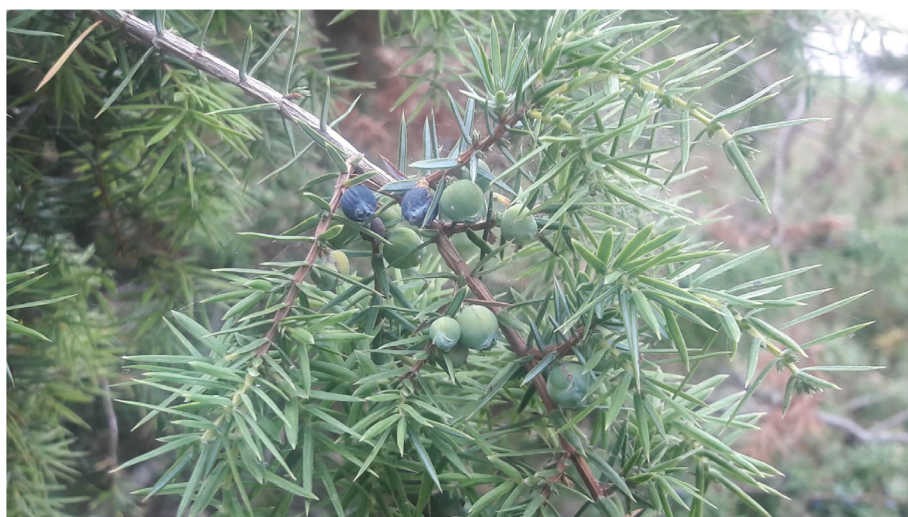


FIGURE 2 *Juniperus communis*. *Juniperus* is a genus comprising about 60 evergreen shrub and tree species native to the Northern hemisphere. Leaves are scale-like or needle-like, decussate, or in whorls of three

patient reacted to volatile oil from the juniper plant she was carrying, although it is possible that sun exposure aggravated what would otherwise have been no more than a mild volatile-oil-induced rubefacient effect.

A further possibility is that the patient experienced a photo-aggravated irritant reaction to lignans (podophyllotoxin or desoxypodophyllotoxin) present in the leaves of the juniper. It has long been recognized that *Juniperus* species can be a source of these substances,⁹ and these well-known irritants have been reported from *J. communis*.^{10,11} These lignans appear to be secondary metabolites produced by endophytic fungi^{12,13} that colonize the roots when the

plant is stressed, so the levels of these lignans are likely to vary. We have not been able to explore this possibility further.

The possibility that the skin reaction we observed was caused by insecticide or fungicide residues, or by a fungal pathogen on the leaves was also contemplated but discounted as unlikely.

Although we have been unable to carry out further investigations in this patient, we have reported this case because of the peculiarity of the lesions and to highlight the need to consider the possible adverse effects associated with the concomitant exposure to common plants and sunlight when evaluating patients with burn-like lesions and blisters.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

antonella tammaro: Conceptualization; data curation; supervision; writing-review and editing. **Ganiyat Adenike Ralitsa Adebajo:** Data curation; writing-original draft; writing-review and editing. **Camilla Chello:** Formal analysis; methodology; supervision; writing-review and editing. **Francesca Magri:** Data curation; formal analysis; methodology. **Alvise Sernicola:** Conceptualization; data curation; visualization; writing-original draft. **Nazareno Gagliostro:** Data curation; formal analysis; methodology; supervision. **Francesca Romana Parisella:** Formal analysis; methodology; writing-review and editing. **Flavio Tarquini:** Data curation; formal analysis; investigation; methodology; resources; supervision; writing-original draft. **Giulia Wappner:** Conceptualization; data curation; formal analysis; supervision.

ORCID

Antonella Tammaro  <https://orcid.org/0000-0002-4230-100X>

REFERENCES

1. Egami S, Yamagami J, Amagai M. Autoimmune bullous skin diseases, pemphigus and pemphigoid. *J Allergy Clin Immunol*. 2020;145(4):1031-1047.
2. Farjon A. *A Natural History of Conifers*. Timber Press; 2008.
3. Dooms-Goossens A, Maertens M, van Lint L, Ruys-Catlender CM, Scheffer JJ. Colophony-induced sensitivity to *Juniperus chinensis* L. "Hetzii"? *Contact Dermatitis*. 1984;10(3):185-187.
4. Matos J, Mariano A, Gonalo S, Freitas JD, Oliveira J. Occupational dermatitis from colophony. *Contact Dermatitis*. 1988;18(1):53-54.
5. Meding B, Ahman M, Karlberg AT. Skin symptoms and contact allergy in woodwork teachers. *Contact Dermatitis*. 1996;34(3):185-190.
6. Lovell CR, Dannaker CJ, White IR. Dermatitis from *X Cupressocyparis leylandii* and concomitant sensitivity to colophony. *Contact Dermatitis*. 1985;13(5):344-345.
7. Nothnagel H. *Handbuch der Arzneimittellehre*. Berlin, Germany: August Hirschwald; 1870.
8. Johnson W. Final report on the safety assessment of *Juniperus communis* extract, *Juniperus oxycedrus* extract, *Juniperus oxycedrus* tar, *Juniperus phoenicea* extract, and *Juniperus virginiana* extract. *Int J Toxicol*. 2001;20(2):41-56.
9. Hartwell JL, Johnson JM, Fitzgerald DB, Belkin M. Podophyllotoxin from *Juniperus* species; savinin. *J Am Chem Soc*. 1953;75(2):235-236.
10. Kusari S, Zühlke S, Spiteller M. Chemometric evaluation of the anti-cancer pro-drug podophyllotoxin and potential therapeutic analogues in *Juniperus* and *Podophyllum* species. *Phytochem Anal*. 2011;22(2):128-143.
11. Renouard S, Lopez T, Hendrawati O, et al. Podophyllotoxin and deoxypodophyllotoxin in *Juniperus bermudiana* and 12 other *Juniperus* species: optimization of extraction, method validation, and quantification. *J Agric Food Chem*. 2011 Aug;59(15):8101-8107.
12. Kour A, Shawl AS, Rehman S, et al. Isolation and identification of an endophytic strain of *Fusarium oxysporum* producing podophyllotoxin from *Juniperus recurva*. *World J Microbiol Biotechnol*. 2008;24(7):1115-1121.
13. Kusari S, Lamshöft M, Spiteller M. *Aspergillus fumigatus* Fresenius, an endophytic fungus from *Juniperus communis* L. Horstmann as a novel source of the anticancer pro-drug deoxypodophyllotoxin. *J Appl Microbiol*. 2009;107(3):1019-1030.

How to cite this article: Tammaro A, Adebajo GAR, Chello C, et al. Bullous dermatitis caused by common juniper. *Contact Dermatitis*. 2020;1–3. <https://doi.org/10.1111/cod.13674>