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# ***Uncaria tomentosa* Gel against Denture Stomatitis: Clinical Report**

Lidia Y. Tay, DDS, MSc, PhD,<sup>1</sup> Fabio A. dos Santos, DDS, MSc, PhD,<sup>2</sup> & Janaina H. Jorge, DDS, MSc, PhD<sup>3</sup>

<sup>1</sup>Department of Dentistry, Cayetano Heredia Peruvian University, Lima, Perú

<sup>2</sup>Department of Dentistry, Ponta Grossa State University, Parana, Brazil

<sup>3</sup>Department of Dental Materials and Prosthodontics, Araraquara Dental School, UNESP – Univ Estadual Paulista, Araraquara, Brazil

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## **Correspondence**

Janaina Habib Jorge, Department of Dental Materials and Prosthodontics, Araraquara Dental School, UNESP – Univ Estadual Paulista, Rua Humaitá, 1680, CEP: 14801–903, Araraquara, SP, Brazil.  
E-mail: janainahj@bol.com.br or janainahj@foar.unesp.br

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## **Abstract**

The objective of this study is to report the clinical use of 2% *Uncaria tomentosa* gel against denture stomatitis (DS) as an alternative treatment. The patient was a 65-year-old, denture-wearing woman. At the clinical examination, her palate showed hyperplastic and erythematous mucosa indicating DS type II. DS is a chronic oral disease that affects denture wearers. It occurs as an inflammatory reaction in denture-wearing patients under maxillary prostheses. *Candida albicans* has been reported as the principal etiological agent. An alternative treatment, the topical application of a gel of 2% *U. tomentosa* three times a day for 1 week was given to the patient. After 1 week of this treatment, she had significantly reduced signs of the disease. Despite the existence of a great number of antifungal agents, treatment failure is observed frequently. Phytotherapy is becoming more popular worldwide. Currently, the most promising medicinal Amazonian herb is *U. tomentosa* (Willd.) DC., known as Cat's Claw. Studies of the chemical and pharmacological properties of this medicinal plant have allowed researchers to develop indications for its use. This report demonstrates the effectiveness of *U. tomentosa* against DS.

Oral candidiasis is the most common fungal infection found in humans, primarily affecting elderly people, denture users, and immunocompromised patients. It can affect up to 60% of elderly people who use complete maxillary dentures.<sup>1,2</sup> When this infection is related to the use of dental prostheses, it is called denture stomatitis (DS). It is sometimes referred to as oral candidiasis or chronic atrophic candidiasis in the literature.

DS is an inflammatory reaction of the supporting tissues of the complete and partial removable prosthesis, characterized by hyperemia and edema, and sometimes accompanied by hemorrhagic petechiae. DS can be diagnosed according to the Newton classification,<sup>3</sup> that is, Newton Type I (pinpoint hyperemia with small areas of inflammation in an otherwise normal tissue); Newton Type II (diffuse hyperemia characterized by generalized inflammation of the entire denture-bearing area and a smooth mucosal surface and in which slight trauma may be sufficient to cause bleeding); and Newton Type III (granular mucosa with a nodular hyperemic surface).

Clinical symptoms of the disease may include pain, irritation, and disturbance of salivation; however, many patients with this disease show no symptoms. The etiology shows extreme variation, being considered of multifactorial origin<sup>4-9</sup> and with *Candida albicans* as the principal causative agent. Other *Candida* species such as *Candida glabrata* are commonly identified, especially in medically compromised patients.<sup>10,11</sup>

Different treatments have been proposed for DS. Antifungal medication is the most commonly used, and can be applied topically or systemically. Nystatin, amphotericin B, clotrimazole, and miconazole are some antifungal agents used against oral candidiasis.<sup>12,13</sup> In these cases, prosthesis hygienic orientation and verification of the need to change the denture are included in the treatment.<sup>14,15</sup> In addition, patients who use complete dentures must remove their prostheses during sleep.<sup>16</sup> Suspending the use of the prosthesis can reduce the inflammatory component; however, factors such as fungal resistance to the medicine and drug toxicity lead us to search for alternative treatments.<sup>17</sup>

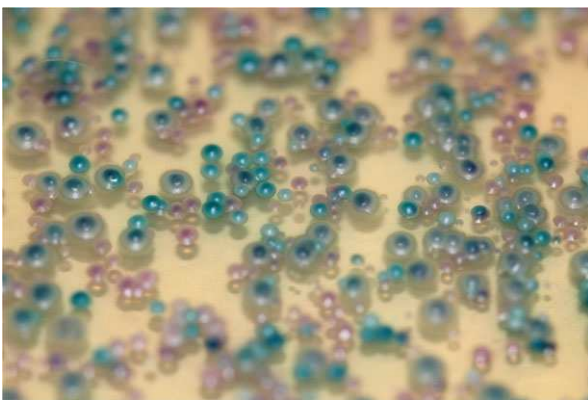
Literature on the topic shows a variety of herbal treatments for various diseases, especially those of inflammatory origin. Medicinal plants have been used throughout many generations, especially for their low cost.<sup>18</sup> Lately, research on these plants has increased.<sup>17</sup> Phytotherapeutic herbs reported in the literature include chamomile,<sup>19</sup> Brazilian pepper (*Schinus terebinthifolius Raddi*), pomegranate (*Punica granatum*), and propolis.<sup>17-21</sup> One of the most promising medicinal Amazonian herbs is *Uncaria tomentosa* (Willd.) DC., or Cat's Claw. This plant belongs to the *Rubiaceae* family and has many traditional uses. The Ashaninka tribe from the Peruvian Amazon has used *U. tomentosa* for centuries for healing wounds, ulcers, fevers, headaches, stomach pains, and infections by bacteria and fungi.<sup>22</sup> Recently, many scientific papers have



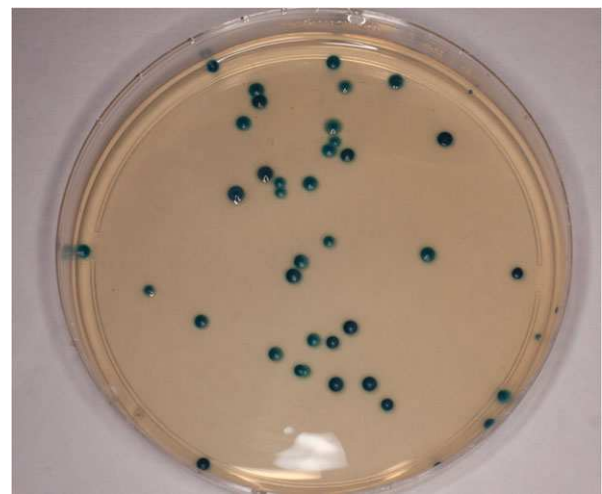
**Figure 1** DS type II (before treatment).



**Figure 3** After 1 week of treatment with 2% *Uncaria tomentosa* gel.



**Figure 2** Presence of colony-forming units (CFU) of *C. albicans* (green), *C. tropicalis* (blue), and *C. krusei* (purple).



**Figure 4** Reduction of all available colonies.

described the use of the *U. tomentosa* for pharmacological and therapeutic treatment. In vitro, animal, and human clinical studies have demonstrated the importance of this medicinal plant. Studies have also shown its effectiveness for treating arthritis due to its anti-inflammatory properties. In cancer treatment, it has immune antimutagenic properties, such as antiviral, antibacterial, and antifungal activities.<sup>22-27</sup>

Considering the aspects mentioned and considering that no clinical report was found in the literature, this report shows the clinical use of 2% *U. tomentosa* gel against DS as an alternative treatment.

### Clinical report

A 64-year-old, denture-wearing woman was referred to the Dental Clinic of the State University of Ponta Grossa (UEPG), Parana, Brazil. She reported that she had worn her prosthesis for 4 years and did not remove it for sleep, but only after meals. An initial anamnesis containing her age, gender, race, medications, diseases, and habits was made. After anamnesis, it was considered that she was healthy. In addition, the patient was in menopause since age 53. At the clinical examination, her palate showed erythematous mucosa, indicating DS type II (Fig 1).

After consultation with the patient, a sample was taken from the palatal mucosa and complete dentures with sterile oral swabs to analyze the presence of colonies of *Candida* spp. Each swab was placed into a test tube containing 5 ml of BHI solution and vortexed for 1 minute to suspend the organisms from the swab. An aliquot of 50  $\mu$ l from this suspension was spread plated on Hi-crome agar *Candida* and incubated at 37°C for 48 hours. Colonies were counted (CFU) and identified by colony color. The results showed the presence of large amount of colonies of *C. albicans*, *Candida tropicalis*, and *Candida krusei* (Fig 2).

After approval from the Human Research Ethics Committee of the Department of Dentistry of the Ponta Grossa State University (Protocol: 17572/10), the treatment started. Following brushing with soft bristles, treatment included the use of 2% *U. tomentosa* gel, three times daily for 1 week. The gel covered the entire surface of the prosthesis and was then placed into the mouth. It was recommended to the patient to remove the prosthesis to sleep.

After 1 week of treatment, a decline of palatine mucosa hyperemia and reduction of the degree of DS was observed (Fig 3). Also, colonies were again counted (CFU) and identi-

fied by colony color. Mycological analysis found a significant reduction of all viable colonies (Fig 4). Clinical evaluation was also performed 1 week after the end of treatment, which found the palatal mucosa without any degree of hyperemia, reducing the DS degree of the patient. After treatment, the patient was referred to the prosthetic clinic to replace the old prosthesis. In addition, the old denture was relined for use as a provisory after the treatment of DS.

## Discussion

Fungal resistance to medicines available in the market has been reported. This concern has aroused interest in discovering new, alternative antifungal treatment. Studies show that the use of herbal medicine in treating candidiasis can be as effective as conventional antifungal therapy.<sup>12,21,26,27</sup> When properly used, medicinal plant extracts have the advantage of low toxicity.<sup>28</sup>

*C. albicans* is the most common species found in DS. Other *Candida* species such as *C. tropicalis*, *C. krusei*, and *C. glabrata* have also been identified, but in a lesser percentage.<sup>8</sup> From the lyophilized extract of *U. tomentosa*, and using the Natrosol gel as its inert base, it is possible to obtain a gel of *U. tomentosa* at concentrations of 2%, which has demonstrated, in vitro, an antifungal effect on colonies of *Candida spp.*<sup>26</sup> In this context, Paiva et al<sup>27</sup> conducted a study to evaluate clinical effectiveness of *U. tomentosa* on oral candidiasis. After mycological confirmatory analysis, 20 patients were selected and divided into two groups: 10 patients received *U. tomentosa* to perform three applications per day for 2 weeks, and the other 10 patients formed the control group and performed the same regimen with 4% Miconazole gel. The clinical results were similar in both groups, showing that *U. tomentosa* was as effective as Miconazole.

Based on the clinical observations, a significant improvement in DS after using 2% *U. tomentosa* gel can be observed. The properties of *U. tomentosa* have been validated by numerous experimental studies demonstrating its antiviral, antioxidant, antiproliferative, immuno-stimulant, antimicrobial, and anti-inflammatory activities.<sup>27,28</sup> There are two chemotypes, with different patterns of tetracyclic or pentacyclicoxindole alkaloids, present in *U. tomentosa*. The pentacyclicoxindole alkaloids have immune modulatory effects antagonistically inhibited by tetracyclic oxindole alkaloids.<sup>29</sup> In addition, *U. tomentosa* was able to inhibit the expression of tumor necrosis factor- $\alpha$ , which is known to stimulate the acute phase reaction of the inflammation processes.<sup>30</sup> On the other hand, an in vitro study conducted by Ccahuana-Vasquez et al<sup>31</sup> showed no activity of *U. tomentosa* on *C. albicans* growth. This difference may be associated with the concentration employed in the studies. In addition, the gel form of the treatment has shown more success in its application than other antifungals, such as nystatin, found in oral solutions in contact with the lesion for shorter periods than the gel. The product is applied directly to the clean prosthesis, which acts as a tray, giving the product more contact with the lesion, resulting in a better and more rapid regression of symptoms.

Other factors may have contributed to the improvement of the situation, such as brushing and storing dentures in water overnight. The biofilm reduction may be related to the mechanical action exerted by the brush bristles in direct contact

with the biofilm and to the hydrodynamic forces resulting from the friction of liquid flow during the brushing procedure, contributing to the mechanic rupture of the biofilm.<sup>32</sup> According to Ramage et al,<sup>15</sup> the presence of mature biofilm may result in high levels of inflammation, but this can be controlled through denture cleansing.

In addition, awareness of the disease, access to information, and guidance offered to the patient may have favored the results of this situation, since the patient was encouraged to maintain correct hygiene of the mucosa and prosthesis, removing it for sleep. Therefore, further studies will be needed to demonstrate the effectiveness of *U. tomentosa* gel in treating DS. Furthermore, tests that assess the biocompatibility of the product are also needed.

## Conclusion

*U. tomentosa* gel was an effective topical adjuvant treatment; however, the influence of the prescribed hygiene methods should be evaluated in future studies.

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