

A Professional PerioCream® Product

# PerioTabs®

**Helps reduce gingivitis, periodontitis, peri-mucositis and peri-implantitis**

A unique brushing solution eliminating pathogenic biofilm accumulation on gums, teeth and dental implants



Dr. Bart De Wever, Ph.D.  
Chief Scientific Officer  
bonyf AG, Vaduz, Liechtenstein  
[cso@bonyf.com](mailto:cso@bonyf.com)



Made in Switzerland



# Overview of the presentation

- About bonyf AG
- Introduction: periodontal disease and peri-implantitis: definitions
- The problem: pathogenic biofilm formation
- The solution: PerioTabs<sup>®</sup>: a NitrAdine<sup>®</sup> based anti-biofilm formula
- Efficacy & safety data
- Scientific references on NitrAdine<sup>®</sup>

# About bonyf AG

- Developer and producer of highly innovative dental/woundcare products:
  - PerioTabs®
  - OlivaFix® Gold: unique denture adhesive cream based on organic olive oil
  - AphtoFix®: oral adhesive gel against RAS (aphthous stomatitis)
  - HeelFix®/FingerFix®: topical cream for cracks in heels/cuts in fingers
  - Ortho-Junior®/Senior-Tabs®: anti-biofilm tablets for removable orthodontics/dentures
- Founded in 1979
- HQ based in Vaduz, Liechtenstein
- Production of products in Buchs, Switzerland
- Patented core technologies

# Definitions: periodontal disease and peri-implantitis

- Periodontal disease, comprising of gingivitis and periodontitis, is the most common disease of mankind affecting 70-90% of the population. Chronic periodontitis is affecting 30-50% of the population worldwide and 10% have severe forms.
- Peri-implant disease is a recent phenomenon comprising of peri-mucositis (inflammatory lesion of the soft tissues surrounding a dental implant), and peri-implantitis (inflammatory lesion of the soft tissues surrounding a dental implant which results in loss of supporting bone).
- The incidence of peri-implant disease is estimated to affect up to 35% of all dental implant patients and is especially high in periodontic patients, smokers and diabetics.

*(Ref.: The new classification of periodontal and peri-implant diseases and conditions, Spring 2018)*

# The problem: biofilm accumulation

- Gingivitis, periodontitis, peri-mucositis and peri-implantitis have different disease characteristics. However they have a shared risk factor in common: pathogenic biofilm accumulation on gums, bone and implant. Biofilm is a progressive build-up of pathogenic micro-organisms including bacteria, fungi, viruses on the gingiva, bone or implant material resulting in a three-dimensional highly resistant «plaque».
- Biofilm accumulation induces local chronic inflammation, bleeding, pain and eventually tissue destruction (both gum and bone), and can induce systemic inflammatory diseases including cardiovascular problems, lung disease, diabetes, Alzheimer's and organ failure.
- The current «gold-standard» treatment for periodontal/peri-implant disease is based on the use of local chlorhexidine combined with systemic antibiotic treatment, but efficacy is low and several undesired side effects are observed.

# The solution: PerioTabs®

- PerioTabs® is a unique and easy-to-use brushing solution for gums and teeth
- Helps reduce gingivitis and periodontitis
- Helps reduce (the risk of developing) peri-mucositis and peri-implantitis
- The active formulation of PerioTabs® is NitrAdine®: a safe, non-antibiotic biofilm removal formulation
- No side effects such as teeth colouration, corrosion or burning sensations
- Medical Device Class I and patent pending in USA and EU (EP15798353.7 and US 15/526,247)

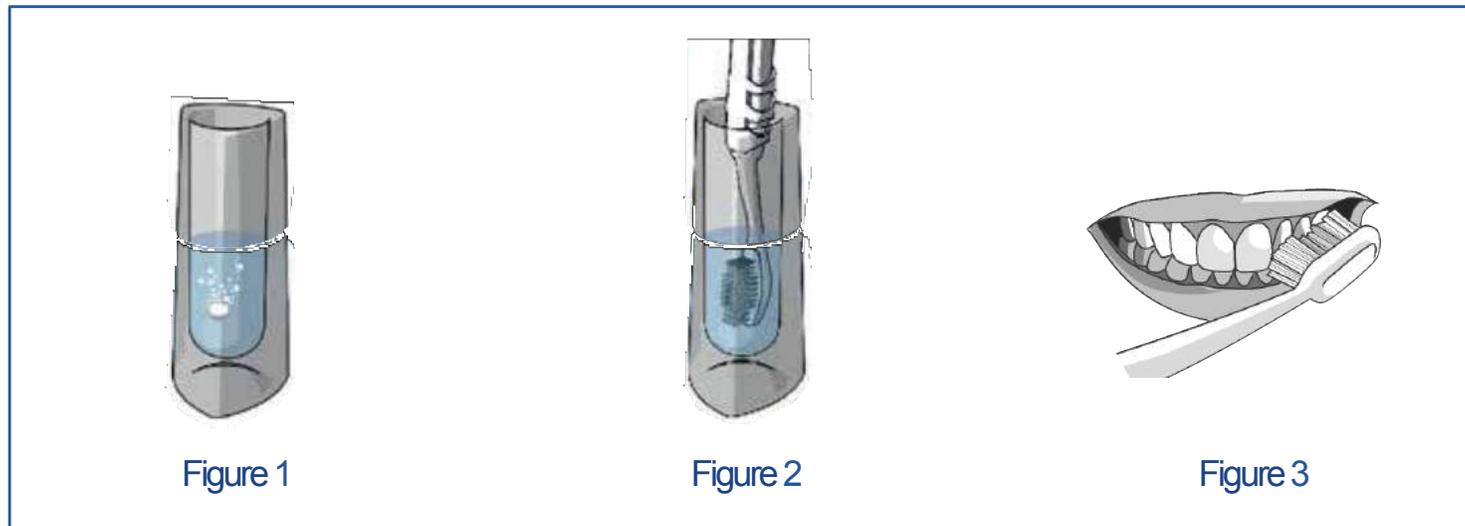
# The solution: PerioTabs®

- PerioTabs® is a 'take-home' kit for the patient, consisting of:
  - 10 small effervescent NitrAdine® tablets
  - 1 small container
- PerioTabs® should be used by the patient for 10 consecutive days as a **brushing solution** to brush teeth and gums



# How to use PerioTabs®

- 1 effervescent tablet is to be dissolved in 15 ml of lukewarm water in the provided container (Figure 1).
- While the tablet is dissolving, the toothbrush should be immersed in the solution and left for 15 minutes. This will allow the toothbrush bristles to absorb the PerioTabs® solution (Figure 2) before brushing commences.
- The patient should then brush teeth and gums for 2 minutes (Figure 3) for 10 consecutive days (toothbrush not provided).



# What is NitrAdine®?

- NitrAdine® is a unique tablet formulation, once dissolved in lukewarm water, that results in a highly active solution that removes pathogenic biofilm from teeth, gums and dental implants to clinically insignificant levels.

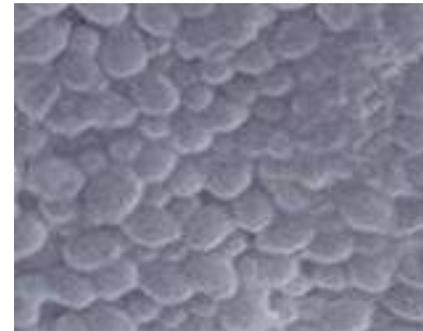
- Mode of action: NitrAdine®'s efficacy is based on the combination of a high concentration of surfactant (SLS) and other ingredients. The surfactant denatures the biofilm/micro-organism membrane proteins, whilst the other ingredients result in a slow release of a non-toxic concentration of only 0.02% hypochlorite, killing all micro-organisms (bacteria, fungi and viruses) present within the biofilm. (NitrAdine® is not hypochlorite. Hypochlorite, also called bleach, is a 2-10% concentration of NaOCl, which is toxic and cannot be used in the mouth).

- Non-toxic to gums (non-irritating, non-sensitizing).
- Non-antibiotic.
- Non-corrosive to metal parts.
- Non-erosive to dentine or enamel.

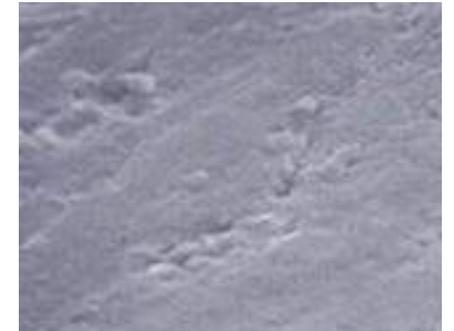


# Efficacy of NitrAdine® on oral medical devices

- Biofilm removal efficacy *in vitro* (biofilm cell cultures)
- NitrAdine® treatment of contaminated porous acrylate (MMA) results in a strong reduction of biofilm containing:
  - Candida albicans
  - Pseudomonas aeruginosa
  - Staphylococcus aureus (including MRSA)
  - Streptococcus mutans
  - Herpes simplex I



Contaminated MMA  
with Candida  
biofilm



5 min. treatment with  
NitrAdine®

*Ref.: Glass et al (2004), Coenye et al (2006)*

# Efficacy of NitrAdine® on oral medical devices

## Biofilm removal efficacy in orthodontic treatment (ROA)

A 15 min treatment of removable orthodontic appliances (ROA) with NitrAdine® tabs (Ortho-Junior®) demonstrate excellent results in children with ROA-induced stomatitis.



*Before*

*1 week after treatment*

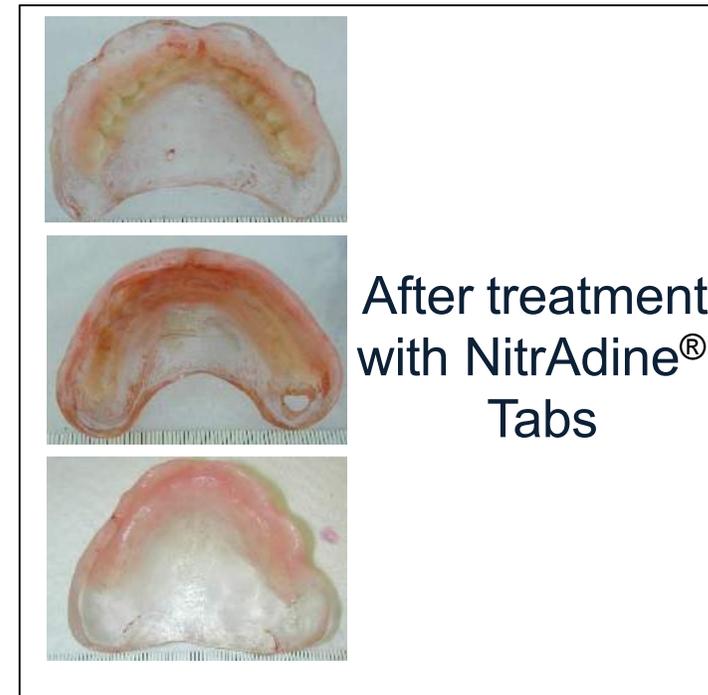
*1 month after treatment*

*Ref.: Van De Vannet et al (2006)*

# Efficacy of NitrAdine® on oral medical devices

## Clinical biofilm removal efficacy in elderly denture wearers

21-day daily treatment of dentures with NitrAdine® tabs demonstrate significant biofilm reduction on the dentures.



*Ref.: Da Silva et al (2012)*

# Efficacy of NitrAdine® on oral medical devices

## *In vitro* anti-microbial evaluation on toothbrushes

15 min NitrAdine® treatment of contaminated toothbrushes results in a 100% reduction of:

- Candida albicans
- Ps. aeruginosa
- Str. mutans
- Str. pyogenes
- E. coli

<b>77/9-FC Test A</b>	Candida Albicans CFU/100ml test solution	Pseudomonas <u>Aeruginosa</u> CFU/100ml test solution	Streptococcus <u>Pyogenes</u> CFU/100ml test solution	Escherichia Coli CFU/100ml test solution	<u>Streptococcus</u> <u>Mutans</u> CFU/100ml test solution
Inoculation	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>	10 <sup>6</sup>
3 min	0	0	0	0	0
5 min	0	0	0	0	0
15 min	0	0	0	0	0
1 h	0	0	0	0	0
6 h	0	0	0	0	0
12 h	0	0	0	0	0

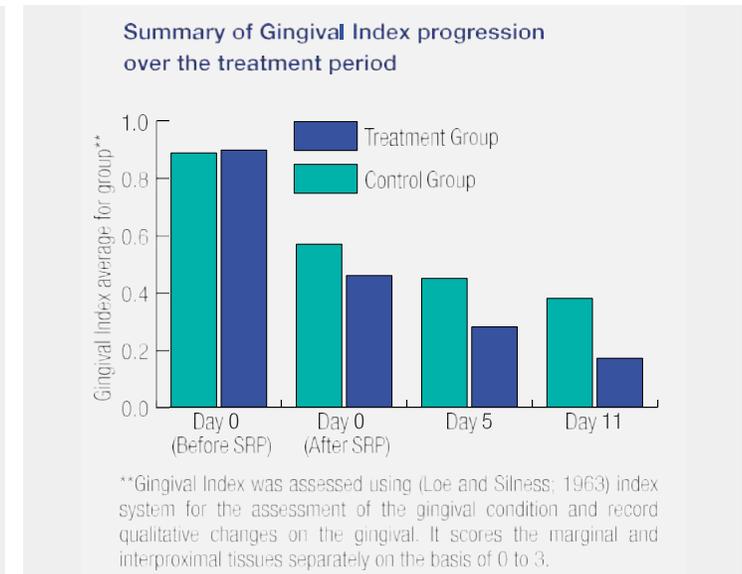
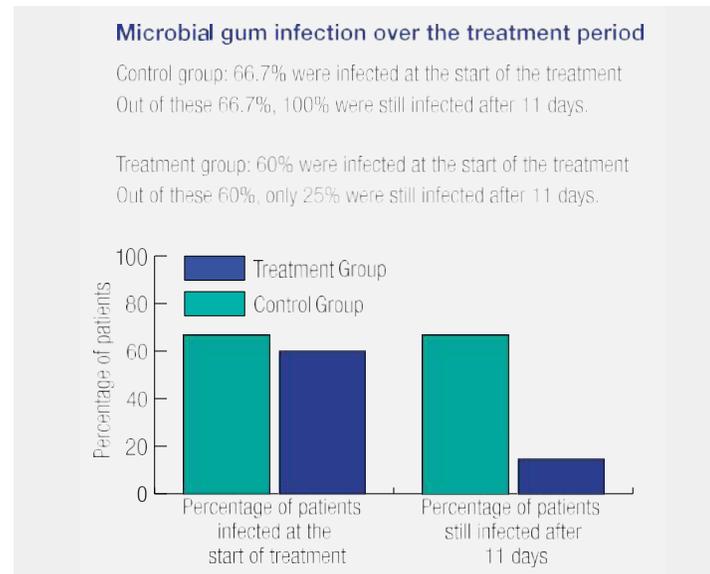
Ref.: IPAS report (2002)

# Efficacy of PerioTabs®

## Clinical trial with 20 chronic periodontal patients (after SRP)

PerioTabs® treatment (10 day brushing of gums and teeth) results in a significant reduction of:

- Plaque index
- Gingival index
- Bleeding
- Halitosis
- Gum pain



Ref.: Sakly et al (2017)

# Efficacy of PerioTabs®

## Clinical trial with 20 chronic periodontal patients (after SRP)

PerioTabs® treatment (10-day brushing) results in a strong reduction periodonto-pathogenic bacteria including:

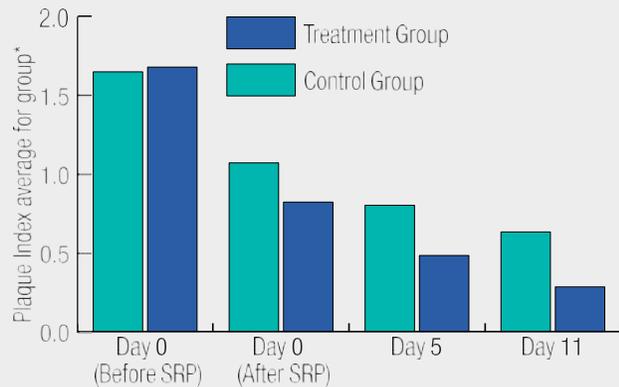
- Porphyromonas gingivalis
- Prevotella intermedia
- Aggregatibacter actinomycetemcomitans

*Ref.: Sakly et al (2017)*

# Efficacy of PerioTabs®

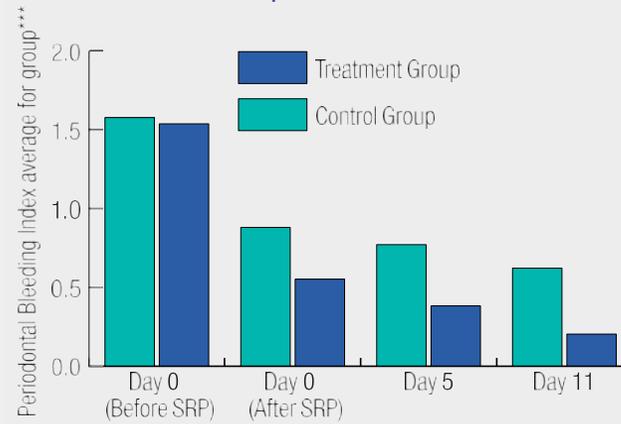
**Post-market clinical evaluation study by 4 dentists on 19 chronic periodontal patients (after SRP) confirmed the positive results obtained in the clinical trial.**

Summary of Plaque Index progression over the treatment period



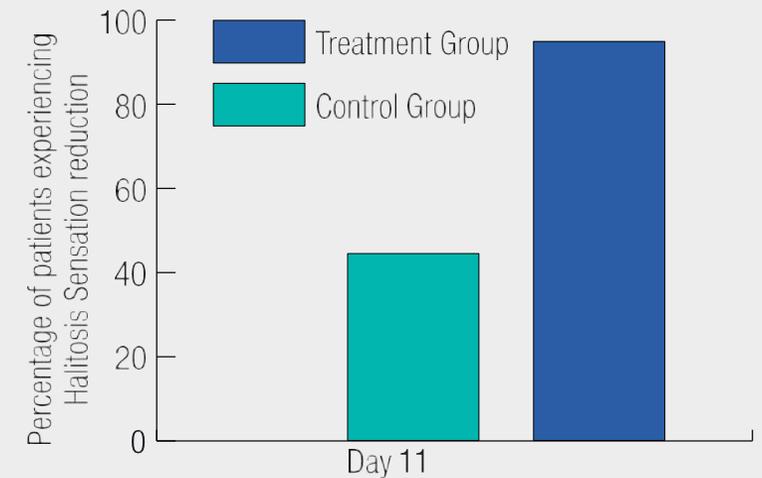
\*Plaque levels were assessed using the Turkey modification of the Quigley-Hein Plaque Index.

Summary of Periodontal Bleeding Index progression over the treatment period



\*\*\*Periodontal Bleeding Index was measured using Muhleman and Son 1971 score chart, which described the sulcus bleeding.

Halitosis sensation after 11 days



Ref.: bonyf internal report (2017)

# Efficacy of PerioTabs®

## Case study 1



*Before Scaling and Root Planing (SRP)*



*After SRP/ 10 days brushing with the PerioTabs® solution*

# Efficacy of PerioTabs®

## Case study 2



*Post  
SRP*



*Post SRP/ 10 days brushing with the  
PerioTabs® solution*

# Efficacy of PerioTabs®

## Case study 3



*Before*



*After 5 days brushing with the PerioTabs® solution*

# Efficacy of PerioTabs®

## Case study 4



*Before*



*After 10 days brushing with the PerioTabs® solution*

# Efficacy of PerioTabs®

## Case study 5



*Before*



*After 10 days brushing with the PerioTabs® solution*

# Efficacy of PerioTabs®

## Case study 6



*Before*



*After 10 days brushing with the PerioTabs® solution*

# Efficacy of PerioTabs®

## Case study 7



*Before*



*Before*



*After 10 days brushing with  
the PerioTabs® solution*



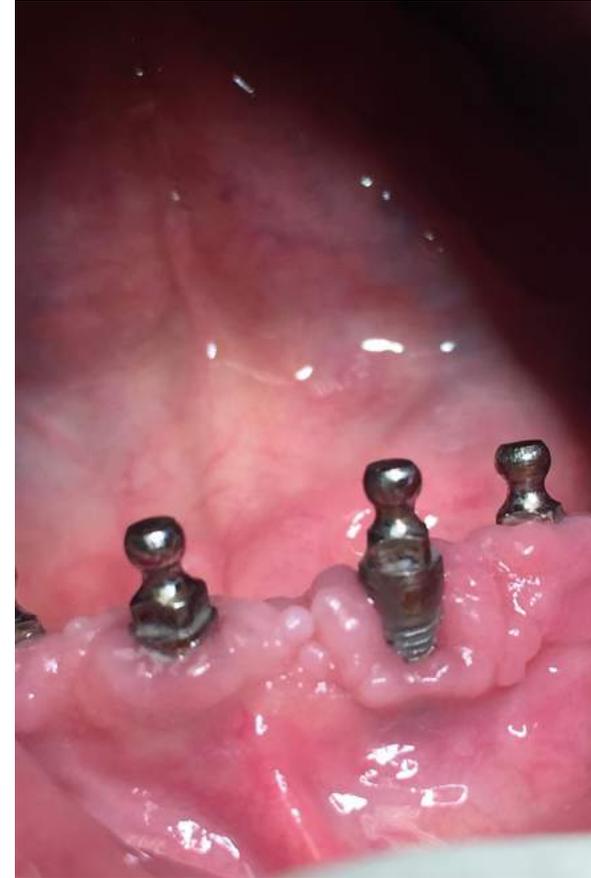
*After 10 days brushing with  
the PerioTabs® solution*

# Efficacy of PerioTabs®

## Case study 8



*Before*



*After 10 days brushing with the  
PerioTabs® solution*

# Efficacy of PerioTabs®

## Case study 9



*PRE-OPERATIVE*



*After 14 days brushing with the PerioTabs® solution*

# 20 on-going clinical & research evaluation trials

- **Brazil:** HIV-patients with chronic periodontitis (Prof. Da Silva, Univ. Sao Paulo)
- **Switzerland:** Patients with gingivitis/periodontitis/peri-mucositis/peri-implantitis (Prof. Özcam, Univ. Zürich)
- **France:** *in vitro* periodontal biofilm efficacy/ Patients with periodontitis (Prof. Dridi, Univ. Nice)
- **Malta:** Patients with gingivitis and chronic periodontitis (Prof. Mascolo, EIMS)
- **Italy:** Patients with gingivitis (Dr. Pirelli, Torino)
- Italy: Diabetic patients with periodontitis (Prof. Marconcini, Univ. Pisa)
- Italy: Patients with gingivitis/periodontitis/peri-mucositis/peri-implantitis (Prof. Epifani, Univ. Milano)
- Italy: *in vitro* gingival biofilm efficacy (Prof. Rimondini, Univ. Navora)
- **Spain:** *in vitro* periodontal biofilm efficacy study/ Patients with peri-mucositis/peri-implantitis (Prof. Herrera, Complutense Univ. Madrid)
- Spain: Patients with desquamative gingivitis (Prof. Garcia-Pola, Univ. Ovieda)
- **Romania:** Patients with periodontitis (Prof. Corsagera, Univ. Cluj)
- Romania: Patients, heavy smokers, with gingivitis (Prof. Puscadu, Univ. Contanta)
- Romania: Patients with periodontitis (Prof. Aranka, Univ. Cluj)
- Romania: Patients with periodontitis (Prof. Goguta, Univ. Timisoara)
- **Belgium:** Patients with periodontitis (Prof. Lambert, Univ. Liège)
- **Germany:** Patients with peri-implantitis (Dr. Stolzel, Univ. Würzburg)
- **The Netherlands:** Patients with periodontitis (Prof. Danzer, Univ. Amsterdam) *TBC*
- **Scotland:** *in vitro* gingivitis biofilm efficacy (Prof. Ramaga, Univ. Glasgow) *TBC*
- **Israel:** Patients with gingivitis and periodontitis (Prof. Bichacho, Tel-Aviv) *TBC*

# Safety of NitrAdine®



## Safety data obtained with the NitrAdine® solution:

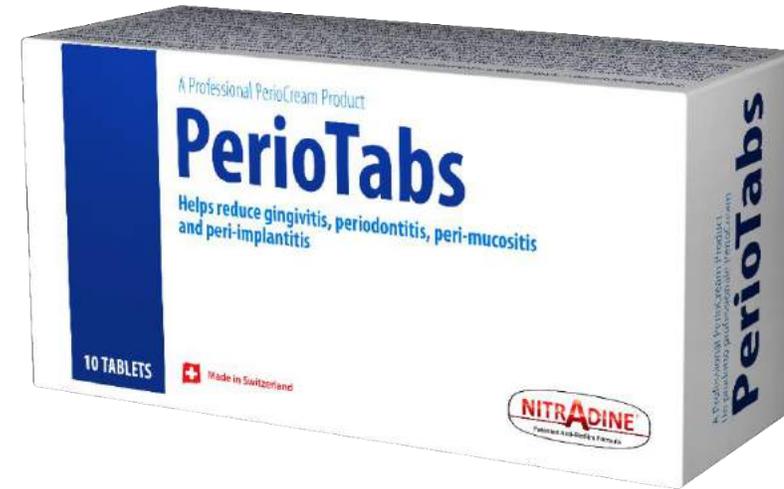
- Oral irritation studies in hamsters: NON-IRRITANT
- Skin sensitization study in guinea pigs: NON-ALLERGIC
- Human safety: NO ADVERSE EFFECTS REPORTED
- Ingestions risk: NitrAdine® solution should not be ingested
  - May cause moderate irritation of oral tract mucosa
  - Abdominal discomfort of pain, diarrhoea, nausea, vomiting

*Ref.: Tox reports: Toxikon, Bedford, USA/ InterTek, Leicester, UK*

# Scientific references on NitrAdine®

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# Thank you for your attention



Heiligkreuz 16  
FL-9490 Vaduz  
Liechtenstein, Europe

Phone: +423 232 78 15  
Fax: +423 232 51 88  
Email: [administration@bonyf.com](mailto:administration@bonyf.com)



[www.periotabs.com](http://www.periotabs.com)

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