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TECHNICAL REPORT

DIFFERENTIATION OF *Candida dubliniensis* FROM *Candida albicans* WITH THE USE OF KILLER TOXINS

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SUMMARY

The aim of this study was to report the ability of killer toxins, previously used as biotyping techniques, as a new tool to differentiate *C. albicans* from *C. dubliniensis*. The susceptibility of *C. albicans* and *C. dubliniensis* to killer toxins ranged from 33.9 to 93.3% and from 6.67 to 93.3%, respectively.

KEYWORDS: Killer toxins; Biotyping: *Candida dubliniensis.*

Killer toxins are glucoprotein compounds secreted by *Hansenula* and *Picchia* strains, which may cause pores in the cytoplasmatic membrane of the *Candida albicans*, inhibiting its growth. Because the susceptibility of *C. albicans* to killer toxins is variable, the phenomenon was employed as a method to biotype different *C. albicans* strains[2,3,6]. In recent years, biotyping techniques have been advantageously substituted by molecular methods.

Since 1995 when *C. dubliniensis* was proposed as a new species of *Candida* genera, many techniques have been studied in order to phenotypically differentiate this species from *C. albicans* because both species are germ tube positive and form chlamydospores in corn meal agar[14].

Nowadays, the definitive identification of *C. dubliniensis* requires molecular methods and thus old phenotypic tests have been re-evaluated, as well as new tests having been proposed for phenotypic identification. Among them, we can emphasize: niger seed agar[13], sunflower agar[7], sesame seed agar[9] based on chlamydoconidia production, and colonial morphology. Other tests include absence of opacity on Tween 80 agar[4], coaggregation of *C. dubliniensis* with *Fusobacterium nucletaum*[5], inability of *C. dubliniensis* to grow in hypertonic broth (NaCl 6.5%)[1], and to grow at temperatures of 42 °C or 45 °C[10]. Among commercially disposable methods, the CHROMagar *Candida*[8] and Bichro-Dublin Fumouze®[12] are worthy of mention.

The aim of this study was to investigate the ability to differentiate *C. albicans* from *C. dubliniensis* based on susceptibilities to killer toxins as proposed by POLONELLI *et al*. (1983). The yeasts employed for the assays were: *Hansenula* sp Stumm 1034 (K1), *Pichia* sp Stumm 1035 (K2), *Hansenula anomala* UM (K3), *Hansenula anomala* CBS 5759 (K4), *Hansenula anomala* Ahearn UN 866 (K5), *Hansenula californica* Ahearn WC 40 (K6), *Hansenula canadensis* Ahearn WC 41 (K7), *Hansenula dimmenae* Ahearn WC 44 (K8), and *Hansenula mrakit* Ahearn W1C51 (K9)

The susceptibility of *C. albicans* and *C. dubliniensis* to killer toxins ranged from 33.3% to 93.3% and from 6.67% to 93.3%, respectively. Twenty-one biotypes were registered and the code numbers 111, 611, and 211 were the most frequently observed in both species. No biotypes occurred as a particular characteristic of *C. dubliniensis* and thus the killer toxins were unable to differentiate *C. albicans* from *C. dubliniensis*. As far as we know, this technique had not been explored until now.

RESUMO

Avaliação das toxinas killer na diferenciação entre *Candida albicans* e *Candida dubliniensis*

Avaliou-se a capacidade das toxinas killer, previamente utilizadas na biotipagem de *C. albicans*, como método para diferenciar *C. albicans* de *C. dubliniensis*. A susceptibilidade de *C. albicans* e *C. dubliniensis* às toxinas killer variou de 33,9% a 93,3% para *C. albicans* e de 6,67% a 93,3% para *C. dubliniensis*.

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