·技术方法·

RapIDYeast Plus 系统在鉴定常见酵母中的临床应用

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[摘要] **目的**：探讨 RapIDYeast Plus(RYP) 系统在鉴定临床常见酵母中的作用。**方法**：将所试菌株在沙氏培养基上传代 2 次，然后 30℃孵育 24～48 h 后，用 RYP 系统进行试验。**结果**：150 株临床分离株中有 139 株被正确鉴定到种的水平；有 8 株得到了具有 2 种或 2 种以上可能性的鉴定结果，而在使用了附加试验后都得出了正确的鉴定结果；有 3 株鉴定错误。RYP 系统在不用附加试验的情况下鉴定的准确率达到 92%，采用附加试验后鉴定的准确率达到 98%。**结论**：RYP 系统适用于临床微生物实验室的常规鉴定，在不需要特殊仪器的条件下，就能准确地鉴定临床上 40 多种酵母菌和酵母样菌。

[关键词] RapIDYeast Plus 系统；酵母菌
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Clinical application of RapIDYeast Plus system in identifying 150 clinically common yeasts

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[**ABSTRACT**] **Objective**: To study the role of RapIDYeast Plus (RYP) system in identifying common clinical yeasts. **Methods**: The target strains were cultured and passaged twice on Sabouraud dextrose agar, and were fed to RYP system after 24-48 h incubation at 30℃. **Results**: One hundred and thirty-nine of the 150 target strains were identified to the level of species correctly, and 8 undetermined strains were confirmed by additional tests. It was found that 3 strains had been incorrectly identified by RYP system. The accuracy of RYP system was calculated as 92% without additional tests and 98% with additional tests. **Conclusion**: RYP system is suitable for routine tests in clinical microbiological laboratory; it can accurately identify more than 40 kinds of yeasts and yeast-like bacteria in clinical practice.

[**KEY WORDS**] RapID Yeast Plus system; yeasts

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酵母菌和酵母样真菌所引起的真菌感染日益增多，但由于不同种的真菌对于抗真菌药物的敏感性不同，所以对其作出快速、准确的鉴定至关重要。RapIDYeast Plus(RYP, Innovative Diagnostic Systems, Norcross, Ga.)系统是一种使用单底物酶试验的 4 h 微量鉴定条，它是基于被试分离株中产生的预成酶来鉴定酵母菌，通过样品中显色底物的颜色变化来判定反应结果，有些孔需要使用附加试剂。文献报道[1,2]该系统将酵母菌和几种类酵母真菌鉴定到种的准确性达 94%～98%，可鉴定 40 余种酵母。本研究于 2003 年 3 月开始以 RYP 系统对 150 株酵母菌和酵母样真菌临床分离株作了检测，现报告如下。

1 材料和方法

所有菌株均分离自临床患者的痰、咽、尿、粪、血液、脑脊液等，经沙氏培养纯化，用常规方法鉴定到属一级水平。将所试菌株在沙氏培养基上传代 2 次，然后 30℃孵育 24～48 h 后，用 RYP 系统进行试验。步骤如下：将纯化好的单个菌落接种至试剂盒配备的培养液中，所制备的菌悬液的浊度与 3 号麦氏浊度大体相等，然后将菌悬液倒入试剂盒的板条中，来回摇动，放平，倾倒入 RYP 系统的 18 个孔中，放入 30℃培养箱孵育 4 h 判定结果。将每 3 孔的反应结果分为一组，根据结果阳性或阴性进行记录，最终得到一行 6 位数的编码，将它与常见编码经验生成数据库进行比对，从而鉴定出被试分离株。

2 结 果

大部分菌株反应结果清晰，易于判读，检测结果如表 1 所示。150 株中有 139 株(92.7%)被正确鉴定到种的水平而且未使用附加试验；8 株(5.3%)得到了具有 2 种或 2 种以上可能性的鉴定结果，而在使用了附加试验后都得出了正确的鉴定结果，其中包括 3 株近平滑念珠菌(中型无绿藻/近平滑念珠菌，附加形态学试验)、1 株热带念珠菌(热带念株菌/酿酒酵母，附加形态学试验)、2 株季也蒙念珠菌(无名念珠菌/季也蒙念珠菌，附加七叶苷利用试验)、1 株克柔念珠菌(酿酒酵母/克柔念珠菌，附加形态学试验)、1 株新生隐球菌(新生隐球菌/Pichia 属，附加形态学、苯酚氧化酶、荚膜试验)，需要使用的附加试验很容易操作而且是基于形态学方法。另有 3 株(2%)被鉴定错误，其中 1 株季也蒙念珠菌被 RYP 鉴定为无名念珠菌，1 株高里念珠菌被 RYP 鉴定为光滑念珠菌，1 株白念珠菌被 RYP 鉴定为热带念珠菌。

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表 1　用 RYP 系统鉴定酵母和酵母样真菌

Tab 1　Common yeasts identified by RapIDYeast Plus system

（*n*）

Strain	*N*	Correctly identified species	Possibilities	Incorrectly identified species
Candida albicans	78	78	0	0
Candida parapsilosis	12	9	3	0
Candida tropicalis	16	14	1	1
Candida guilliermondi	14	3	2	0
Candida famata	6	5	0	1
Candida humicola	2	2	0	0
Candida glabrata	8	7	0	1
Candida krusei	12	11	1	0
Cryptoccocus neoformans	10	9	1	0
Rhodotorula rubra	5	5	0	0
Candida lusitaniae	2	2	0	0
Candida ciferrii	1	1	0	0
Hansenula anomala	1	1	0	0
Rhodotorula glutinis	3	3	0	0
Total	150	139	8	3

3　讨　论

鉴定酵母菌及酵母样真菌的商品化试剂盒有 API20C、Uni-yeast-TeK、Vitek 系统和 Baxter Microscan 系统。API20C 系统需要 72 h，而 Vitek 和 Uni-yeast-TeK 系统也需要 48 h 才能获得可靠的鉴定结果，Baxter Microscan 系统在 4 h 后得到鉴定结果。API20C 作为商业化的酵母鉴定方法已被许多真菌实验室所运用，其与快速常规方法有 97％的一致率，Fenn 等[3]发现，API20C 系统在改进了系统培养液和数据库后，结合形态学基本上能达到 99.3％的鉴定正确率，因此，我们在这次评估中，150 株菌的鉴定同时采用了 API20C 作为对照，发现 RYP 系统在不用附加试验的情况下，鉴定的准确率也达到了 92％，运用了附加试验准确率可达到 98％。

在此次研究中，RYP 系统在 5 h 内准确鉴定出了 92％的被试分离株，被检测的菌株中包含了常见和罕见酵母及类酵母真菌的广谱的分类单元群组成，仅有 8 株（5.3％）需要使用附加试验，3 株未被正确鉴定出酵母，鉴定的错误率为 2％。我们的体会是对于反应孔中的颜色必须由有经验的试验人员来观察和记录结果，电脑测试结果使用英文版的编码系统可以提高鉴定菌株的准确性，菌株还必须是在培养 48 h 的新鲜菌株，可避免假阳性的结果。RYP 系统的优点是适用于临床微生物实验室的常规鉴定，它的特点是快速、准确、重复性好。在不需要特殊仪器的条件下，就能准确地鉴定临床上 40 多种酵母菌和酵母样菌。对偶尔鉴定不出的菌株，只需要使用附加试验形态学方法就能解决，当天就能出报告，而且还具有良好的成本效益。缺点是实验的数据要在电脑上读结果，不适合基层单位开展。此外，颜色判断会有误差，必须专业人员来操作，必要时再用其他商业化的方法来鉴定。

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Effects of low-dose ketanserin on blood pressure variability, baroreflex sensitivity and end-organ damage in spontaneously hypertensive rats

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［**ABSTRACT**］ The present study was designed to investigate the effects of low-dose ketanserin on BPV (blood pressure variability), BRS (baroreflex sensitivity) and organ damage in SHR (spontaneously hypertensive rats). Ketanserin was mixed in rat chow at an estimated dose of 0.1 mg · kg^{-1} of body weight · day^{-1}. SHR were treated for 4 months. BP (blood pressure) was then recorded continuously for 24 h in a conscious state. After determination of BRS, rats were killed for organ damage evaluation. It was found that long-term treatment with low-dose ketanserin did not lower BP levels, but significantly decreased BPV, enhanced BRS and reduced organ damage in SHR. Multiple regression analysis showed that the decrease in left ventricular hypertrophy was most closely correlated (or associated) with the increase in BRS, whereas the decrease in aortic hypertrophy was most closely associated with the decrease in diastolic BPV and the amelioration in renal lesion, with the increase in BRS and the decrease in diastolic BPV. In conclusion, low-dose ketanserin produces organ protection independently of its BP-lowering action in SHR, and this organ protection was importantly attributable to the enhancement of BRS and decrease in BPV.

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