Approaches to Improve Spontaneous Pregnancy Rates of Cynomolgus Monkeys Under Laboratory Conditions



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) Background and Objective

- With the advancement of biotechnology, non-human primates (NHPs) play a critical role in developmental and reproductive toxicity (DART) assessment, particularly when they are the only relevant species available for such studies. However, achieving high pregnancy rates in laboratory settings presents significant challenges, as cynomolgus monkey conception rates are influenced by multifactorial variables that directly affect study timelines, data validity, and resource allocation in NHPs DART studies.
- To address this scientific challenge, our facility (TriApex) has implemented and validated a series of targeted interventions to improve pregnancy success in cynomolgus monkeys under controlled laboratory conditions. Through systematic analysis of mating behaviors and reproductive parameters, TriApex has established strategies to optimize natural conception rates, thereby enhancing the efficiency of NHP DART studies.

) Methods

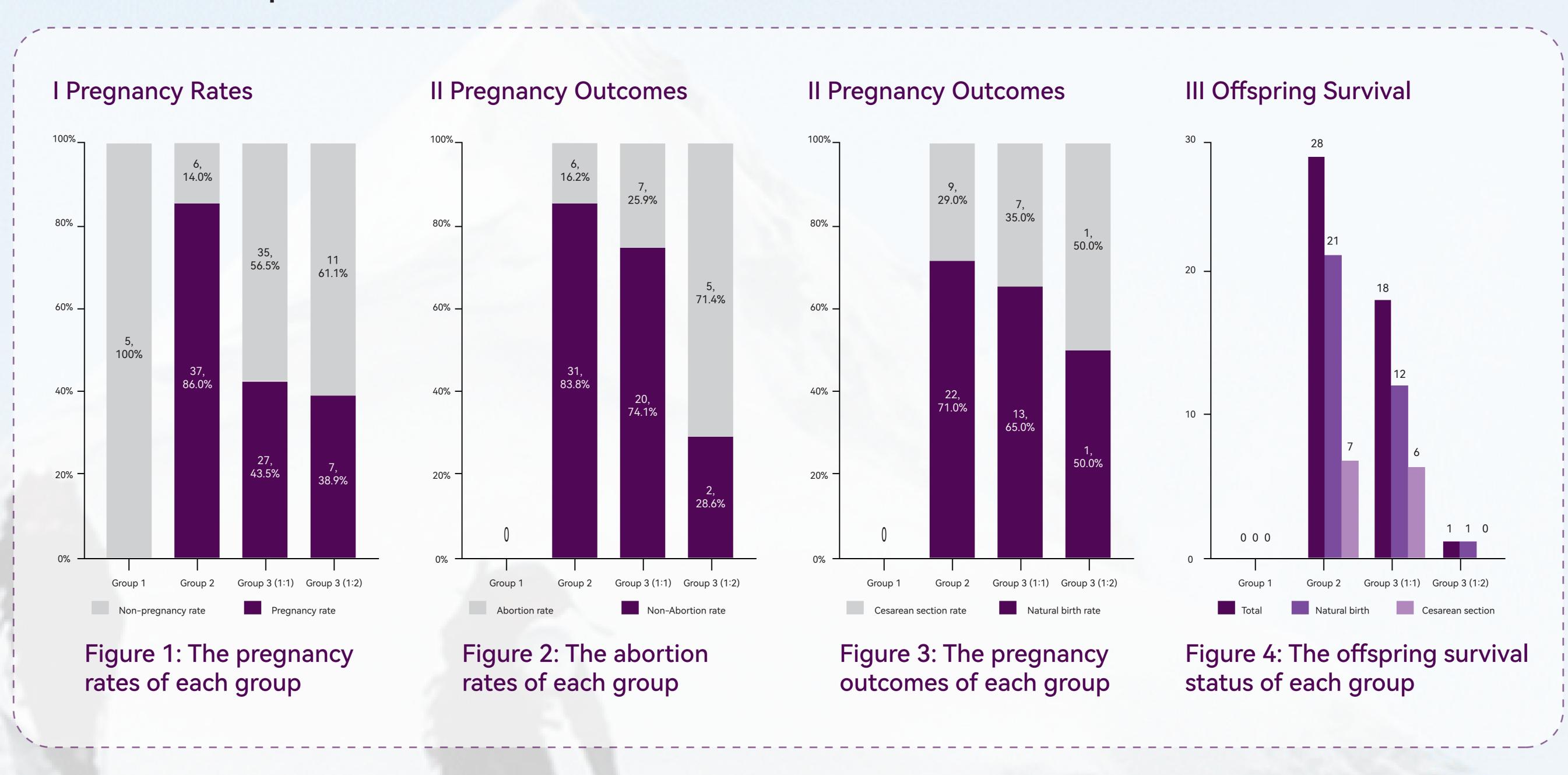
A total of **128 female cynomolgus monkeys** were randomly assigned to three groups, each featuring a distinct male-to-female ratio, along with varied controlled cohabitation timing and duration. Twenty-three male cynomolgus monkeys were also involved in this study.

Table 1: Cynomolgus monkeys were randomly assigned to three groups, with distinct male-to-female ratios conditions and control variations in cohabitation timing and duration.

Group Situation	Group 1	Group 2	Group 3	
Females	5	43	62	18
∂:♀	1:1	5:1	1:1	1:2
Cage Size(m)	2.2*1.1*1.1	2*1.5*2.2	1.1*1.1	
Mating Situation	Early cohabitation mating: Mating continuously for 3 days	Mating Exploration: Long-term caging until the animal was pregnant or due to abnormal conditions.	Improved mating: Mating continuously for 3 days with sexually mature males starting from the 12th to 14th day of the female's menstrual cycle	
Animal Selection	Without any animal screening measures	Initial screening to ensure no obvious diseases or out-of-range weight		Stable menstrual cycles (3 times) nad skin ifestations ≥ 2.5 kg

Results

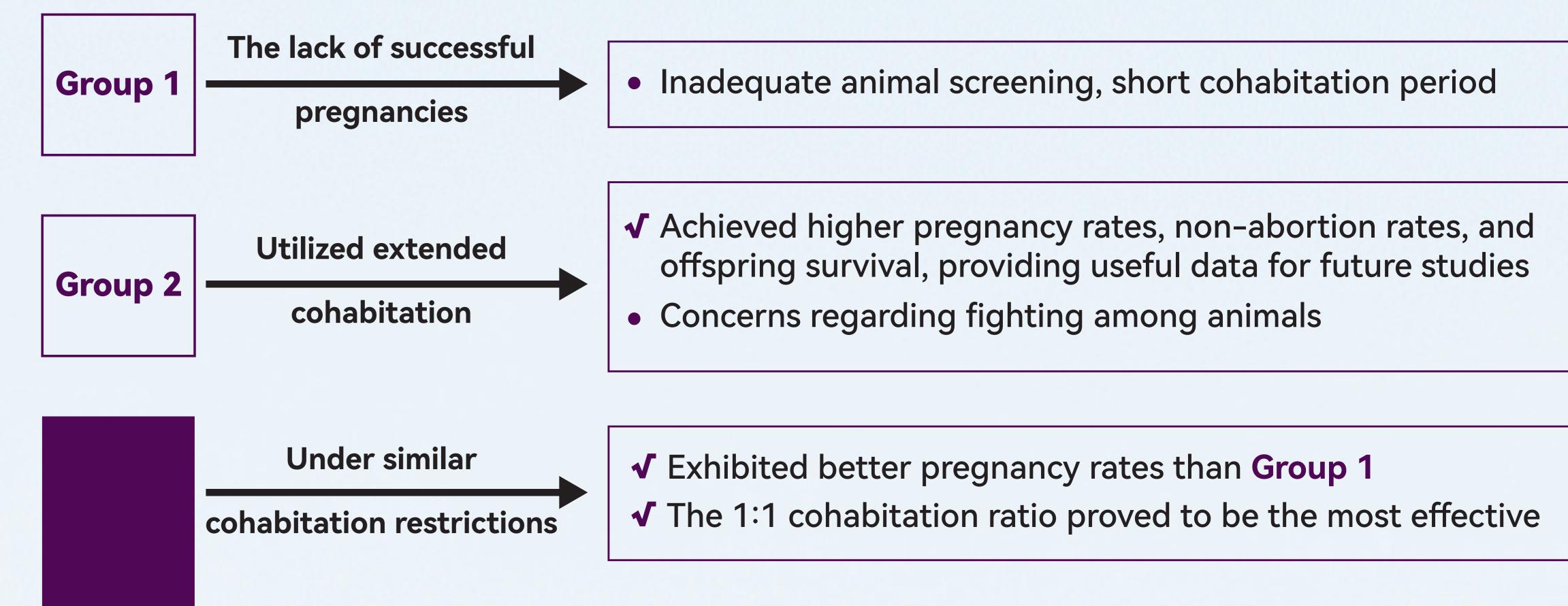
To explore effective measures for improving the natural pregnancy rate of cynomolgus monkeys under laboratory conditions, the pregnancy ratios, pregnancy outcomes, and offspring survival data of each group were analyzed, and compared to derive parameters and measures for practical reference.



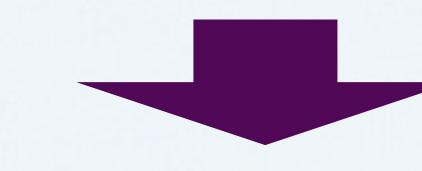
- No successful pregnancies (0.0%, 0/5) in Group 1. The pregnancy rate was 86% (37/43) in Group 2. For Group 3, the 1:1 male-to-female ratio resulted in a pregnancy rate of 43.5% (27/62), whereas the 1:2 ratio showed a rate of 38.9% (7/18).
- Due to the lack of pregnancies, Group 1 did not provide the relevant data of pregnancy outcomes. In Group 2, the non-abortion rate post-pregnancy was 83.8% (31/37), with 71.0% (22/31) born naturally and 29.0% (9/31) delivered by cesarean section. In Group 3, the 1:1 male-to-female ratio resulted in a non-abortion rate of 74.1% (20/27), with 65.0% (13/20) natural births and 35.0% (7/20) cesarean sections. The 1:2 ratio showed a non-abortion rate of 28.6% (2/7), with an equal number of natural births and cesarean sections.
- No offspring were produced in Group 1. In Group 2, the overall offspring survival rate was 90.3% (28/31), with a 95.5% (21/22) survival rate for naturally born offspring and a 77.8% (7/9) survival rate for those delivered by cesarean section. In Group 3, the 1:1 ratio yielded a survival rate of 90.0% (18/20), with a 92.3% (12/13) survival rate for natural births and an 85.7% (6/7) survival rate for cesarean-born offspring. The 1:2 ratio had a 50.0% (1/2) survival rate, with a 100.0% (1/1) survival rate for naturally-born offspring.

Conclusion

Through practical application, significant improvements have been achieved in the pregnancy rate of cynomolgus monkeys, demonstrating the successful implementation of these measures.



- This suggests that rigorous animal screening, appropriate male-to-female ratios, and timely cohabitation practices significantly enhance the natural pregnancy rates of cynomolgus monkeys.
 - The broad application of these measures also facilitates the efficient conduct of subsequent DART studies involving cynomolgus monkeys in laboratory settings.



- TriApex Laboratories Co., Ltd. has successfully identified and validated several effective measures to improve the pregnancy rates of laboratory cynomolgus monkey through professional research and practice, despite the ongoing challenge of achieving high pregnancy rates under laboratory conditions. This success is attributed to TriApex Laboratories Co., Ltd.'s robust supply chain (Kunming Biomed International, KBI) for macaque monkeys and the extensive experience in supporting experiments with these primates in laboratory settings.
- The establishment of the **NHP DART research platform** has launched a robust basis for various NHP studies, including ePPND tests. It not only guarantees reliable support but also highlights exceptional competitiveness in technology, resource integration, and research standardization, ultimately driving high-caliber research across related fields.